Working Paper 2

Transportation Plan

SAN FRANCISCO DEPARTMENT OF CITY PLANNING

WORKING PAPER NUMBER TWO

THREE ALTERNATIVE PROPOSED POLICY PLANS PRELIMINARY TO A REVISED TRANSPORTATION PLAN FOR SAN FRANCISCO

TRANSPORTATION PLAN PROJECT
DEPARTMENT OF CITY PLANNING
CITY AND COUNTY OF SAN FRANCISCO
MARCH 1968

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INTRODUCTION

AND

DEFINITIONS OF TERMS

Working Paper No. 1, December, 1966, dealt specifically with the transportation problems of downtown San Francisco. It pointed out the major growth of employment occurring in the Central Business District and the urgent need for early steps - primarily improved mass transit - to improve access into and out of the core of the City.

The purpose of this paper is to present and describe three different plans for a road and transit network for all of San Francisco, emphasizing respectively:

1. A major reliance on mass transit throughout the City;

2. A major reliance on mass transit in the Central Business District and on the auto elsewhere;

3. A major reliance on the auto throughout the City.

As a preliminary to the presentation of the three different plans, the common elements basic to transportation planning for the City are discussed as Goals, Principles, and Standards of the San Francisco Transportation Plan. Working Paper No. 1 included proposed objectives for a new transportation plan as approved by the City Planning Commission, and these are reviewed in this paper as goals. Principles and standards are in part from the previous transportation plan adopted in 1951 and amended in 1955; new principles and standards, not previously approved by the Planning Commission are included in this paper.

Each plan is based on a different emphasis. Therefore, each plan has its own Set of Policies for decision-making appropriate to its particular emphasis. Each plan attempts to illustrate the probable citywide consequences of a consistently followed set of policies.

For clarity, the following definitions of transportation terms as used in this paper are included:

DEFINITIONS OF TERMS

Goals	Desired ends towards which plans are directed.
Principles	Essential elements or qualities upon which plans are based.
Standards	Criteria for measuring adequacy of plans for a given purpose.

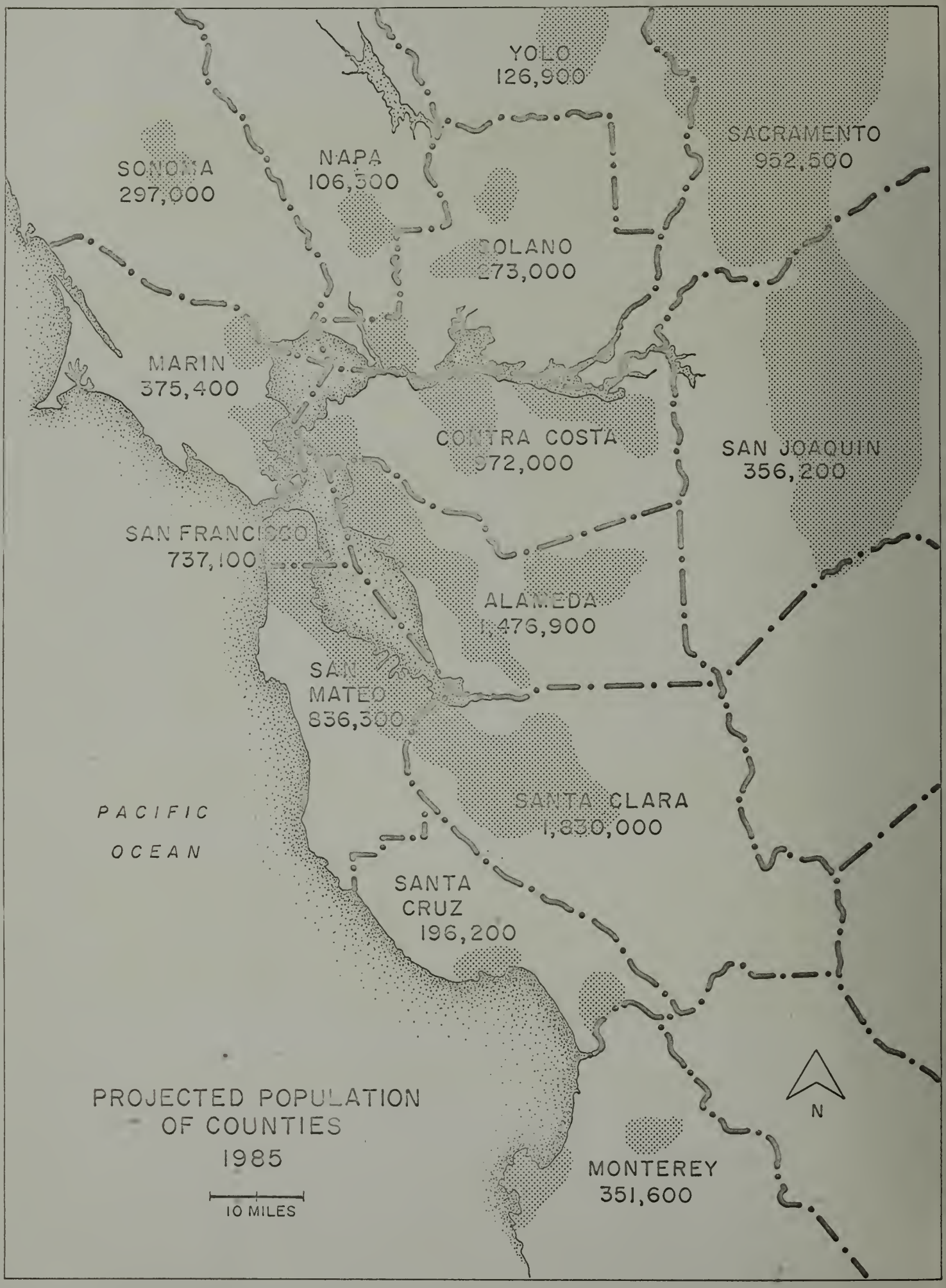
Policies	Settled courses of action toward the goals, or the decision rules that will be applied in moving toward the goals.
Programs	Allocation of resources by type, time, amount, and location in line with established policies to achieve the goals.
Existing Developments	Projects already in existence, funded, or approved for construction.
Expected Developments	Projects already authorized or being considered.
Proposed Development	Project set forth in one of the alternative plans as a course of action, subject to policy decisions by the City.
CBD (Central Business District)	A geographical area of San Francisco, stretching north to Vallejo Street, west to Franklin Street and the Central Freeway and south to Bryant Street.
Intercity Roads	These are roads whose primary function is to carry large volumes of traffic between San Francisco and other cities, through San Francisco, and between major districts of San Francisco. As such they make up a basic network or system of roads that helps establish the physical structure and role of the Region, of San Francisco as an integral part of the Region, and of San Francisco itself. In most cases these would be limited access, high capacity roads (freeways) but they could also be controlled access routes (such as expressways) if volume characteristics and local physical and economic conditions so dictated.
Arterials	These are roads that connect with the intercity routes, are of high capacity design, and/or whose volume within the City consists in large part of inter-district traffic. They are roads (such as Market, Portola and Geary) that are of citywide significance not only in terms of their traffic characteristics, but also in terms of their function of giving form and identity to the City.

Major Streets	These are primarily of significance within the districts of the City, carry a smaller proportion of inter-district traffic than the Arterials, and may be of consequence in establishing the physical structure of a district.
Local Streets	These are roads whose primary function is to serve adjacent uses, whether residential, industrial, or commercial. They carry as little inter-district traffic as possible and are designed to restrict through-traffic.
Mass Transit	Service provided for carrying passengers and their incidental baggage on established routes and fixed schedules within cities and metropolitan areas.
Intercity Transit	Service provided for carrying passengers between the central areas of cities within and between metropolitan areas.
Rapid Transit	A fixed rail service on exclusive right-of-way operating without interference from other traffic or pedestrians, at speeds above 20 miles per hour with station stops spaced more than one-third of a mile apart.
Vehicular System	Road network for movement of rubber-tired vehicles including private automobiles, trucks, taxis and buses.
Subway-Surface Cars	Operation of passenger service along fixed rail routes under controlled access conditions and connecting with rapid transit subways. When on street, rapid movement is facilitated by traffic signal timing and auto access limitations. (Where they are in subway, subway-surface routes are shown on plans as rapid transit routes.)
Rail Bus	An experimental conversion of a standard bus into a road or rail vehicle by adding steel wheels which are lowered after the bus has been driven into position over the rail line.
Reserved Bus Lanes	Lanes on city streets restricted during certain hours to exclusive use by mass transit and emergency vehicles.

Express Bus	Operation of passenger service in rubber-tired vehicles along surface streets specifically designed for preferential bus movement and loading. Rapid movement of vehicles is facilitated by signal timing and auto access limitations.
Local Transit	Mass transit on city streets without provision for preferential movement of transit vehicles.
Commuter Railroads	Railroad systems operating a form of rapid transit service over their facilities in metropolitan areas.
Transit Capacity	The maximum number of passengers that can be transported over a given section of a transit route in one direction during a given time period (usually one hour) under prevailing traffic conditions.
Express Service	A type of operation providing higher speed with fewer stops than generally exist on local transit lines, in order to traverse fairly long distances as rapidly as possible.
Feeder Service	Local transit service to pick up or deliver passengers in connection with a transfer at a rail rapid transit station or commuter railroad station.
Headway	The time interval between successive vehicles or trains moving along the same track or route in the same direction.
Network	The configuration of transit routes and stops which constitute the total system.
Terminal	The terminating point of transportation routes of one or more modes with transfer facilities and amenities for passenger convenience.
Water Transit	Passenger ferry boats with various speed, design and capacity characteristics (includes conventional boats, air-cushion vehicles and hydrafoils).

II

THE REGIONAL SETTING


YOLO
126,900
SACRAMENTO
952,500
SONOMA
297,000
NAPA
106,300
SOLANO
273,000
MARIN
375,400
CONTRA COSTA
672,000
SAN JOAQUIN
356,200
SAN FRANCISCO
737,100
ALAMEDA
1,476,900
SAN
MATEO
836,300
SANTA CLARA
1,830,000
PACIFIC
OCEAN
SANTA
CRUZ
196,200
MONTEREY
351,600
N
PROJECTED POPULATION
OF COUNTIES
1985
10 MILES

One would hardly think of solving all of Manhattan's problems within the context of the tight island that it is; or of planning for it without considering the whole of the City of New York and the surrounding region. In many respects San Francisco can be likened to Manhattan, the key island, or center of an urban area and surrounding region. We provide many of the necessities for the region, but we also must be provided for, if all of us are to exist and reach our potentials.

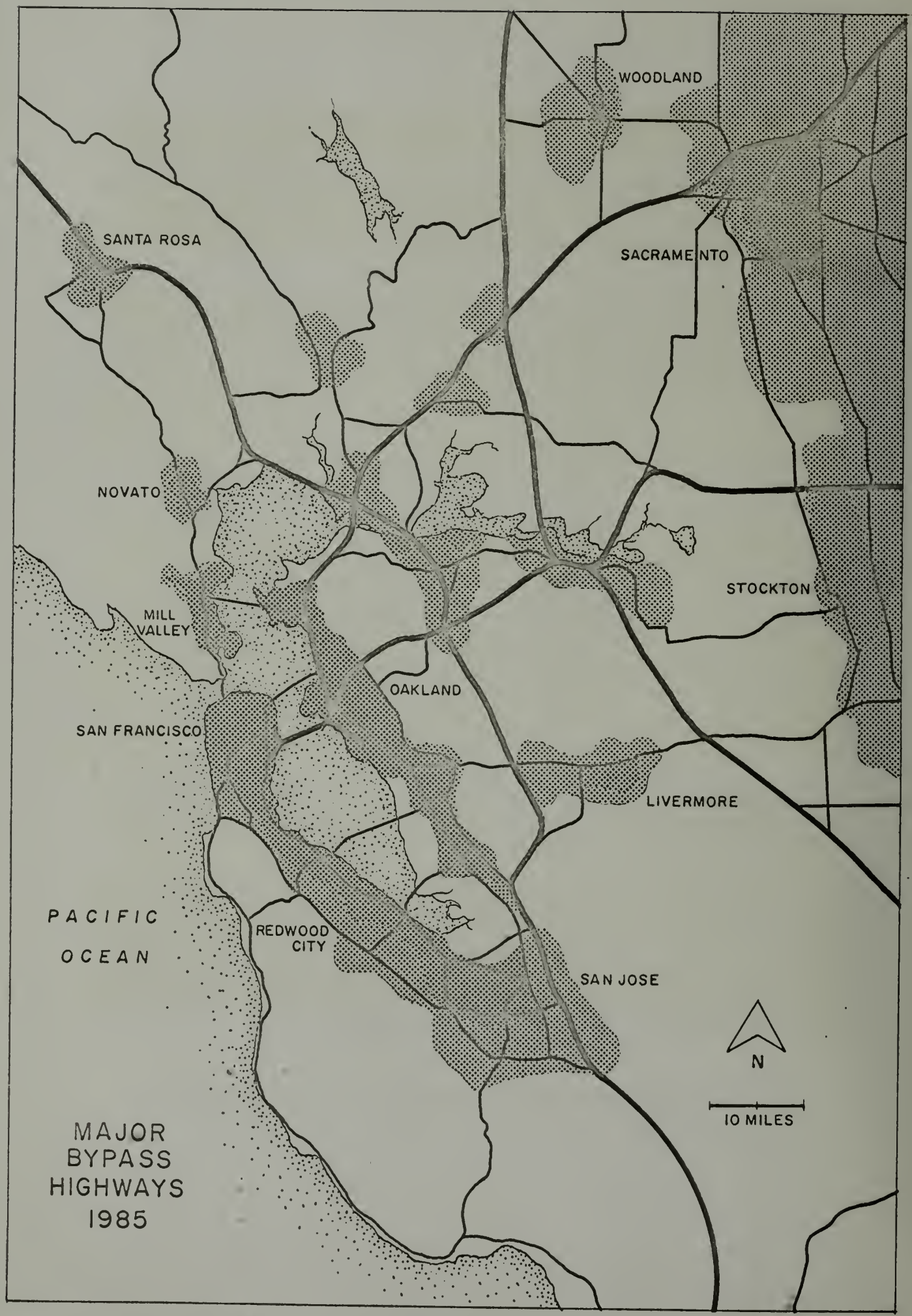
As indicated by the map on the facing page, significant population growth will occur within the nine Counties bordering San Francisco Bay and also in five neighboring Counties. This expanded Bay Area region will come into being with a total population of more than 8.8 millions by 1985, almost double its population in 1960. *

1985	COUNTY	1960
1,476,900	Alameda	912,600
972,000	Contra Costa	413,200
375,400	Marin	148,800
351,600	Monterey	195,300
106,300	Napa	66,400
952,500	Sacramento	510,300
737,100	San Francisco	741,500
356,200	San Joaquin	249,989
836,300	San Mateo	449,400
1,830,000	Santa Clara	658,700
196,200	Santa Cruz	85,100
273,000	Solano	137,100
297,000	Sonoma	148,800
126,900	Yolo	66,400

This table is presented here because it makes a comparison of crucial significance. Whereas each of the other counties is expected to experience significant growth in population, the population of San Francisco may actually decrease or remain stable.

San Francisco is now, and proposes to remain for the future, the dominant City in finance, commerce, government and entertainment. During the day, more than 200,000 persons come in to work and shop, and by night, our cultural and entertainment facilities play host to 50,000 visitors. Compact and efficient, the City offers much to the region, but stands to lose more if her unique contributions are ignored. And so might the region lose. San Francisco needs to be easily accessible to all the region, without losing her character.

* Population projections, Department of Finance, State of California


WOODLAND
SANTA ROSA
SACRAMENTO
NOVATO
STOCKTON
MILL VALLEY
OAKLAND
SAN FRANCISCO
LIVERMORE
PACIFIC OCEAN
REDWOOD CITY
SAN JOSE
N
10 MILES
MAJOR BYPASS HIGHWAYS 1985

Thus, a primary goal of San Francisco is recognition of the need to preserve and enhance her role as the major focal point of the region.

Vital to achievement of this goal are major decisions regarding the transportation system, and mass transit in particular. There must be increased emphasis on mass transit in the West Bay, including service to San Francisco's International Airport and to the North Bay Counties, to insure the role of San Francisco in the region.

Two important decisions have already been made. First, the voters' approval of the BARTD bond issue of 1962 began a three county rapid transit system which promises to provide fast and efficient movement of people from three East Bay lines through tubes under the Bay to San Francisco. This decision will make it possible for more people to come into the City without their cars, thus reducing the total need for downtown parking and prolonging the efficient life of the Bay Bridge. The cost of the tubes comes from toll funds which otherwise would have been needed much earlier to build a second bay crossing for automobiles.

Second, the Panhandle and Golden Gate Freeways were disapproved in 1966. They would have provided for greater auto movement between San Francisco and Marin and Sonoma Counties with no allowance made in these plans for rapid transit. Approval of the two freeways would have necessitated a second auto deck on the Golden Gate Bridge and the widening of Route 101 in Marin County. Approval would also have brought more people into the City with their cars and increased the need for parking and local street improvements in San Francisco. Disapproval of a second deck for autos on the Golden Gate Bridge, subsequent to rejection of the freeways, has brought about consideration of rapid transit to Marin and Sonoma Counties along with the availability of Bridge funds for mass transit purposes which otherwise would have been expended on the auto deck.

These two decisions are of regional importance because they concern two of the major access points into San Francisco, and because in both cases they have tended to make San Francisco more dependent upon mass transit. The consequence of such City policy will be felt throughout the region, and beyond, as major bypass highways, some of which are already built, are constructed to carry traffic not destined for San Francisco. As populations increase and the Sacramento, Monterey, and San Francisco Metropolitan Areas become more interdependent, intercity passenger rail lines may become needed to supplement air and auto travel. Following is a description of the expanded regional road and rail network as it may develop.

North Bay Counties

Santa Rosa will have more than doubled its present population by 1985, when the Counties of Marin and Sonoma will have 672,400 persons.

Depicted from north to south, a bypass of the San Francisco-Oakland area will be available on State Routes 12, 121 and 37 through Sonoma, Vallejo, across the Benicia Bridge and south to a junction with U.S. 101 south of San Jose. The number of vehicles using this bypass will be determined to some extent by what decisions are made regarding the future use of the Golden Gate Bridge.

Santa Rosa would logically be the future terminal of a Marin commuter railroad or rail rapid transit system since the greatest population growth will probably occur in northern Marin and the flat areas around Santa Rosa and Petaluma in Sonoma County.

Northeast Counties

The counties of Sacramento, San Joaquin and Yolo to the northeast will also be twice as large in population in 1985, numbering 1,435,600 persons. The Stockton area will grow to 356,200.

In the interstate travel perspective San Francisco is a major Pacific Coast terminal. By 1985 such traffic will move across the India Basin Bridge which, with the Hunters Point connection on the San Francisco side and new connections in the East Bay, will provide excellent access to Bay industrial areas. Travel across the Sierras and to the east will have two possible routes, one through Sacramento and one bypassing Sacramento:

1. Route 24 through Walnut Creek to Antioch, joining Freeway Route 220 to Sacramento and a junction with Interstate Route 80.

2. State Route 4 from Concord through Pittsburg, State Route 160 from Pittsburg, and Route 12 to Lodi. From Lodi on a new freeway route following the alignment of Route 88 through Jackson northeast to Carson City and passing south of Lake Tahoe.

With the growing interdependence between the State Capital at Sacramento and the financial and administrative functions of San Francisco it is reasonable to anticipate that fast rail passenger service will be needed between these two points. Such a service might also include stops at the State Universities at Davis and Berkeley. The extension of BARTD or connections to it via existing rail rights-of-way are possible. Such a network may also be needed in the Stockton-Modesto area which will have almost 600,000 persons by 1985.

The Peninsula and the Monterey Bay Area

Continuing growth is predicted for the counties south of San Francisco. Most important, a 177% increase will bring Santa Clara County to 1,830,000 persons by 1985. To the south the predicted growth of the Santa Cruz-Monterey area, including the State University at Santa Cruz will bring these two counties to nearly 550,000 persons by 1985.

A highway bypass of the San Francisco peninsula has already been described ("North Bay Counties", above). Urban freeways in the East Bay also include Nimitz and MacArthur through Oakland with connections to the south through Union City and Fremont. On the San Francisco side of the Bay, Junipero Serra and Bayshore Freeways parallel one another on the east side of the mountains with coast Route 1 on the west. One new north-south route is a possibility, the Bayfront Freeway to the east of Bayshore Freeway shown in part in Policy Plan 3. The degree of through travel possible on all routes on the San Francisco side of the Bay will be affected by decisions regarding travel in the Golden Gate Bridge area.

Southern Pacific now furnishes passenger rail service from Monterey and San Jose through other Peninsula cities to a terminal at Third and Townsend Streets in San Francisco. Two trains per day provide longer haul service south to Los Angeles. Future service would be improved by either a Market Street terminal for Southern Pacific trains or a regional extension of BARTD, continuing south to San Jose and beyond. Future long haul service may well depend on the decision to keep commuter rail as now offered by Southern Pacific or to go to rail rapid transit which would require parallel service and probable elimination of all Southern Pacific passenger trains in this area. The failure to include San Mateo and Santa Clara Counties in the BARTD system has made the Peninsula area dependent upon existing rail commuter services as the only alternative to congestion on Bayshore Freeway.

Mass Transit Necessary to Expand Air Travel

Increasing population in the expanded Bay Area region is reflected in predictions for greatly increased air travel. For the two major Bay Area region airports, Oakland and San Francisco, startling growth figures are forecast. In order for this growth to occur expanded road and mass transit facilities must be available.

Predictions of annual air passenger travel for San Francisco International Airport from a recent traffic survey help to define the magnitude of the problem. *

1967	1971	1975
12 million	18 million	24 million

Both Airports, located on filled land in San Francisco Bay, depend upon heavily loaded freeways for access. Oakland, with much smaller air passenger volume, will in the future have bus service from a rapid transit station on the BARTD LINE. San Francisco, with a far more acute problem, may continue to be served by buses which use the congested Bayshore Freeway unless existing commuter railroad service is modified or rapid transit is extended.

Air travel predictions indicate that future limitation of air schedules into San Francisco Airport may be necessary because of limited ground facilities which will be overwhelmed by "jumbo" jets which carry 400 or more passengers and land every 2½ minutes. Only rapid transit has the capability to move such large volumes of people without severe delays during peak periods.

* Traffic Study, San Francisco International Airport" by Wilbur Smith and Associates, December 1967.

III

GOALS, PRINCIPLES, AND STANDARDS

OF THE

SAN FRANCISCO TRANSPORTATION PLAN

GOALS OF THE TRANSPORTATION PLAN

A. Primary Goal

The overall goal of a comprehensive transportation plan for San Francisco is to provide for the safe and convenient movement of people and goods among all neighborhoods, community areas, and working areas, (including the CBD), as well as for all movements to and through the City. Such a plan should recognize and enhance the City's role as the primary financial, business, administrative and governmental center of the region.

B. Sub-goals

1. A balanced system of transportation consisting of rapid transit, local transit and feeder service, intercity routes, arterials, parkways and major and local streets, airports and parking garages, each employed where it is most suitable from the standpoint of present and prospective movements of people, goods, and vehicles, and the present and desirable future use and development of adjoining land areas.

2. A system of transportation minimizing hazards to human life, pollution of the atmosphere, generation of noise, disruption of community or neighborhood organization and introduction of unnatural barriers to local movements.

3. The recognition and augmentation of the major steps already achieved toward a regional rapid transit system through development of a system designed to accommodate expected increases in a metropolitan population without physical or social damage to the central city.

4. Transportation designed to meet present and future social and individual needs of all groups in the City.

5. A transportation system which will take people who are employed in San Francisco quickly and comfortably to and from their places of residence.

6. Coordination of short and long-distance movements of people between the various modes of public and private transportation serving the city, including air transport, automobile, mass transit and water transit, and provision for necessary transportation terminals.

7. Mass transit designed particularly for the aged and those of limited income, and for which a determined level of service rather than economic self-sufficiency of a facility is the first objective of development and design.

8. Facilities for parking garages and loading spaces as elements of the total plan and at locations convenient to destinations but so located that through-traffic is diverted from the Central Business District.

9. A transportation system which is a tool for the preservation of present desirable land uses and the furtherance of desirable future land development and which is compatible to future human relationships in the City.

10. Transportation facilities which will enhance the area in which they are located, through the development and adoption of the highest design standards, in order to protect the attractive appearance of the City and to protect and enhance human values.

11. Transportation facilities specifically related to scenic and recreational enjoyment, including a parkway and boulevard system, scenic drives, and scenic and recreational transit routes.

12. A plan which is Regional in concept, and which relates to the plans of regional agencies and neighboring counties.

PRINCIPLES OF THE TRANSPORTATION PLAN

A. General Principles

Coordination in Development Planning:

The mass transit system and the vehicular system should be planned, and development should be scheduled, so that they are carried out in concert and become complementary elements in the overall transportation plan for the City; this should also be true of other elements in the plan including parking areas and terminals.

Priorities as to Type of Transportation Facility:

1. High-Density Central Areas: An efficient mass transit facility will have high capacities for carrying persons quickly to downtown and other employment and shopping areas with a minimum of traffic congestion and a minimum of interference with the economic use of the land and with amenities. Therefore, facilities for increasing the capacity of the mass transit system should be considered prior to the approval of other facilities, designed to serve private vehicles primarily (a) the existence of which would make such transit facilities difficult or impossible to achieve, and (b) which would compete for economic use of scarce downtown space and interfere with the development of the best downtown amenities.

2. Transportation Corridors: In each of the City's major transportation corridors, priority should be given to the development of an efficient mass transit facility as a trunk route serving the area in preference to development of other facilities primarily designed to serve private vehicles until the need for the latter is clearly established in light of expected utilization of the mass transit facility.

3. Uniformity in System Capacity: Increases in capacity of transportation facilities must be considered in the light of projected future travel demand for the particular system as a whole (vehicular or mass transit), so as to avoid the stimulation of an unbalanced traffic load attracted to the segment in question which might overload related segments of the system, thus requiring costly and/or unnecessary changes to other parts of the system.

4. Coordination of Circulation with Terminals and Parking Garages: Parking garages should be considered as an integral part of the total vehicular system and the construction of new parking garages should be related to street capacity. Terminals should be considered as a part of the mass transit system serving them and their capacities correlated.

5. Downtown Movements - Priority: Within the downtown area, priority of movement on surface streets should favor pedestrians, mass transit vehicles, and private vehicles, respectively.

B. TRANSIT PRINCIPLES

General Characteristics:

1. The mass transit system should serve movements of people which are primarily regular in nature and to and from the downtown area, as well as secondary working districts.

2. The speed, convenience and capacity of the mass transit system should be great enough to support the highly developed downtown land area, as well as secondary working districts, and to insure maximum transit patronage.

3. The mass transit system should operate on a citywide scale, and transit routes should be so located as to provide service to any developed part of the City within not less than one-quarter mile walking distance.

4. The effect of the total route pattern of the mass transit systhem should be to provide the mass transit passenger with the most direct route to his destination, with a minimum number of transfers, and a minimum wait at transfer points.

5. Rapid transit lines, commuter railroads, and intercity roads should be designed to provide the greatest possible degree of convenient interchange with other travel modes.

Functional Types of Public Transit Routes should be:

1. Trunk-line radial routes, both citywide and regional, terminating at or going through the downtown area; these trunk lines should be operated on rapid transit lines wherever possible. Fast through express bus service on radial trunk lines should be provided where rapid transit lines are not practicable or are not yet in operation.

2. Circumferential routes, operating largely on arterial roads or major streets, and connecting residential, business, and working districts outside the Central Business District, and operating as trunk feeders to trunk line radials, connecting with them at rapid transit stations or major express bus stops.

3. Neighborhood Circulation routes, providing feeder service from outlying neighborhood and hilltop areas to the trunk line radial and circumferential transit routes, as well as to community and neighborhood shopping districts, traversing local and neighborhood streets and having termini at rapid transit stations or major stops on express bus lines.

4. Downtown Circulation routes, providing special distribution and feeder service downtown, connecting with rapid transit stations and express bus stops on radial trunk routes, as well as to major parking garages, particularly those in the parking belt. Including shoppers' shuttles within the downtown area, this service should operate with frequent stops and frequent headways, and should operate on two-way streets designated primarily for transit use, with a semi-exclusive curb lane for movement and stopping wherever possible.

5. Recreational, Tourist and City-Viewing Routes: Special vehicle systems should be established to provide for leisurely and recreational travel to provide access to park areas, view points, and areas of tourist attraction, such as the Northern Waterfront, Embarcadero Plaza and Fisherman's Wharf. Including the present cable car system, this system could include other historical vehicles, and consideration could be given to use of funiculars, mini-rail systems elephant trains, mini-buses and water transit modes. Reduction of the need for extensive auto parking areas at recreational, park, scenic, and tourist points, to reduce existing vehicular congestion, can be another objective of such special systems.

C. VEHICULAR PRINCIPLES

General Characteristics of the Vehicular Circulation System should be:

1. To provide for movements of people and goods to the downtown area, oriented primarily to provide for those most essential to the economy of downtown, such as shoppers, business visitors, persons who must use a motor vehicle in their daily work, suppliers, service contractors, messenger services, and with lower priority provisions for persons using private vehicles as a means of going to and from work downtown.

2. To provide for movements of people and goods within the City but not entering the downtown area.

3. To provide for movements of people and goods through the City to be routed so as to by-pass the downtown area wherever possible.

4. To provide facilities meeting high standards of urban design.

5. To provide for movements of private vehicles during peak hours, but in second priority to movements of mass transit vehicles, and with a definite limitation upon future additional space to be provided for peak-hour movements of private vehicles in the downtown area and radial trunk routes leading into downtown.

6. To provide facilities designed to meet high safety standards.

Functional Types of Roads in the Vehicular Circulation System should be: (See also above, Section I, "Introduction and Definitions of Terms

1. Intercity Road: To carry traffic between San Francisco and other cities, or between other cities, or between non-adjacent sections of the city; in most cases they would be limited access high capacity roads such as freeways, but could also be controled access routes, such as expressways.

2. Arterial: High capacity in design, and carrying a large proportion of inter-district traffic, and connecting with Intercity Roads.

3. Major Street: Carrying both inter-district and intra-district traffic, these may have some of the same design characteristics as an Arterial.

4. Local Street: Designed to restrict through traffic movements and carrying smaller proportions of intra-district travel.

Design:

All roads, but particularly Intercity Roads and Arterials, should should be planned under strict urban design controls where continuous grade separation is necessary, priority should be given to use of depressed cross-section design except where topographic considerations require other structural designs. Tunnels and vehicular subways should be used for routes traversing heavily built-up areas.

STANDARDS OF THE TRANSPORTATION PLAN

A. General Standards

1. High Capacity Routes: Where rail and road facilities are used for heavy transit or vehicular movements, they should be designed to be on high-capacity, exclusive rights-of-way, grade separated, continuously or at points required by considerations of safety or traffic congestion.

2. Grade-Separated Routes: Where rail and road facilities are grade-separated, they should not be on overhead elevated structures, but should be depressed with overcrossings for cross streets and pedestrian ways, at grade, or in tunnel. Elevated structures should be avoided, except where strict control over urban design factors are in force, and:

   a. They are not within a residential area, or

   b. They form part of a bridge approach, or

   c. They are required by topographic conditions.

3. Impact on Neighborhoods: Rapid transit lines or intercity roads should be located so that minimum severance of neighborhood unity or functions or visual integrity is created, nor major displacement of existing residential or commercial functions occurs.

B. Transit Standards

1. Rapid Transit Lines: Grade-separated rapid transit lines should be designed for maximum speeds consistent with the need for comfortable and efficient acceleration and deceleration at station stops on the average of every one-third of a mile. Facilities should be designed for initial or eventual use of multiple-unit trains having walk-through capability, whether or not initial use is limited to subway-surface street car trains.

2. Rapid Transit Stations: These should be designed for initial or eventual use of rapid trains having a length of at least 500 feet and platform level loading, but designs should be sufficiently flexible so that use can be made of subway-surface street car trains, either initially, or permanently in joint operation with rapid transit trains, Station facilities should be of outstanding architectural design, spacious, and provided with facilities needed for the fast expeditious, comfortable, and safe handling of high volumes of passengers.

3. Compatible with BARTD: Rapid transit facilities should be built to designs which can be altered at minimum expense to accommodate BARTD trains if there is an advantage in such later convertibility.

4. Transit Service Standards: Standards of service for rapid transit and local transit shall attempt to provide a favorable and attractive "image" encouraging patronage by choice rather than necessity and shall include:

   a. Provision of a sufficient number of vehicles to handle the anticipated passenger loads without uncomfortable crowding;

   b. Sheltered waiting stations at all transfer points, major loading points, and surface bus loading areas at rapid transit stations;

   c. Transit vehicles providing optimum passenger comfort and safety through clean appearance and design, comfortable seating, good ventilation, generous windows, wide entrance and exit doors, minimum noise, and smooth acceleration and deceleration;

   d. Adequate, attractive, esthetically pleasing, readable and specially identifying signs and symbols for identifying vehicles, and providing direction in stations and shelter areas.

C. Vehicular Standards

Intercity Roads: Standards for portions of Intercity Roads within San Francisco shall be:

1. Based on standards for the Interstate System of Defense Highways, or the Federal Aid System of Highways, or the State Highway System - whichever is appropriate for the specific route in question - except that the City and County of San Francisco shall indicate its policy of negotiating with Federal and State Highway authorities to modify these standards where deemed necessary to enhance the appearance of the City, preserve vistas, and avoid undesirable impacts on the City as a whole, a particular community area, or a neighborhood residential area, shopping district, employment, park area, or recreation or visitors area, including impacts on economic, esthetic, and urban design factors caused by severance, nuisance (noise, fumes, excessive motion), displacement and changing the characters of established districts.

2. Designed as grade-separated, limited access high-capacity roads with opposing flows of traffic separated by central dividing or median strip.

3. Located in bored-tunnel or cut-and-cover subway wherever feasible, and in depressed open cut when not in subway, except that continuous elevated structures may be utilized for bridge approaches or where such design is dictated by topographic conditions, or in heavy industrial areas in interior lot locations.

4. Designed with not less than two 12-foot traffic lanes in each direction or more than four traffic lanes in each direction depending upon projected future traffic volumes estimated in view of probable diversion of peak-hour person-trips to planned public transit facilities, and the number of lanes in each direction on particular projects may be restricted to two or three lanes in each direction - despite predicted increases in vehicular traffic volumes - if the narrower design cross-section thereby avoids disruption of community and neighborhood areas through severance, displacement, and interference with urban design factors (i.e., if two lanes in each direction can be fitted into a vehicular subway beneath an existing street thereby avoiding costly property-taking, displacement and neighborhood severance).

5. Designed for speeds not less than 30 miles per hour or more than 50 miles per hour, with lower design speeds being considered preferable in congested areas and near to the Central Business District:

   a. To avoid excessive neighborhood impact of higher-speed designs;

   b. As a reflection of the lower speeds normally encountered in the congested area.

6. Designed with adequate entrance and exit ramps and accelerating and decelerating lanes for the expeditious entrance and exit of vehicles without interfering with continuous flow of traffic on the road.

7. Landscaped and otherwise buffered from adjoining properties to a maximum extent.

Arterials shall be:

1. Connected to Intercity Roads wherever feasible.

2. Designed for two, three, four, or five lanes of traffic in each direction except when the development of such width is not practicable without disrupting the neighborhoods through which they pass.

3. Designed for opposing streams of traffic to be separated by a central dividing or median strip with left turn havens wherever left turns are to be made at intersections. This median can be used to limit cross-traffic by being continuous between major intersections. In areas where streets are narrow and widening is not feasible, this traffic-flow separation principle may be met by application of one-way street controls on adjacent parallel streets.

4. Designed for not less than two 11-foot traffic lanes in each direction; designed for not less than 25 miles per hour in safe design speed.

5. Adaptable to additional peak-hour capacity through use of curb lane towaway, reversible traffic lanes and intersection control.

6. Designed so that grade-separated intersection structures can be installed at heavy traffic intersections.

7. Landscaped wherever feasible.

Major Streets:

1. Should be designed for the continuous movement of heavy volumes of all types of short haul and intra-community vehicular and transit traffic and for collecting and distributing traffic to and from Arterials, Intercity Roads, and stations and major stops of rapid transit and express bus lines.

2. Can be designed to lesser standards than Arterials - i.e., desirable to have separated roadways with two 11-foot traffic lanes, but can be undivided and with one lane in each direction with possibility of peak-hour tow-away curb lane or off-set center strip for two lanes one-way and one lane the other.

[illegible]

1. [illegible]

2. [illegible]

3. [illegible]

4. [illegible]

5. [illegible]

6. [illegible]

7. [illegible]

[illegible]

1. [illegible]

2. [illegible]

IV

THE THREE ALTERNATIVE PROPOSED POLICY PLANS

INTRODUCTION

The purpose of this paper is to explore basic alternative policies for the transportation network of the City.

The three plans are primarily expressions of policy, and the specifics in the plans are reflections thereof.

A first step was to review, update, and formalize the transportation goals, principles, and standards of San Francisco.

Subsequently, studies were begun at the neighborhood scale, where different transportation alternatives were considered, compared to each other, and evaluated in terms of the goals, principles, standards.

Then, adjacent neighborhoods were considered as forming transportation corridors, and the different alternatives were evaluated as they effect not only the neighborhood, but as they complement each other in the corridor pattern.

Next, the corridors were viewed as complementary and as comprising the citywide structure within which all of the neighborhood and corridor transportation alternatives would be compared. Alternatives were grouped by the logic of cause and effect; as a result of this first citywide sorting and grouping, six plans emerged. With these six as a basis, sets of policies consistent with City transportation goals, principles, and standards, were established taking into consideration the plans of our neighbors in the Bay Area region.

The process of refinement of the six plans included elimination of duplication and overlapping, simplification, and dropping of some alternatives to obtain smoothly functioning overall systems. Out of this process emerged the three alternative policy plans, each with its own basis of emphasis, set of policies, and probable citywide consequences.

PROPOSED POLICY PLAN 1

A MAJOR RELIANCE ON MASS TRANSIT THROUGHOUT THE CITY

PLAN 1

Plan 1 is geared to a considerable extent to improvement of mass transit to cope with San Francisco's transportation needs, especially in terms of early improvements to the overall system. This plan assumes that the transportation needs of the City will not be best served by new high capacity roads, that such new vehicular facilities are not

PLAN 1

PLAN 1

Plan 1 is geared to a considerable extent to improvement of mass transit to cope with San Francisco's transportation needs, especially in terms of early improvements to the overall system. This plan assumes that the transportation needs of the City will not be best served by new high capacity roads, that such new vehicular facilities are not likely to be constructed without doing major damage to other community values, that the capacity of the vehicular system is either adequate or that (to the extent that it is not) a change in mode of travel to transit must be achieved and that the City can and will do everything possible to promote mass transit including some restrictions on travel by private automobile. It further assumes that the existing street network can handle auto travel in the City without experiencing increases in volumes great enough to spill over onto streets presently serving only local needs.

Extremely important, a guiding principal in this plan in terms of timing, is that transit must now be given the special consideration previously given the auto in terms of facilities and expenditures for them, if transit is to catch up and compete successfully with the auto. Therefore, if a "balanced" transportation system is provided, expenditures for transit must precede those for highways.

PLAN 1 - SET OF POLICIES

1. The scale of travel by mass transit should be extensive, fast, and convenient enought to have the majority of workers to dense employment areas choose mass transit over auto travel

2. Any major vehicular facility that would compete with or make transit difficult to achieve should be delayed until mass transit facilities are in operation.

3. Whenever possible new rapid transit lines should be routed through downtown as part of a continuous system.

4. The practice of subsidizing parking facilities in areas of dense employment should be discouraged.

5. Major new transportation facilities should be designed underground or in open cut in residential and employment areas wherever esthetic features are involved.

6. Intercity highway travel should bypass the City whenever possible, using the regional Intercity Road system.

7. Intercity helicopter or short takeoff aircraft facilities should be located adjacent to, but not within, the downtown area.

8. Toll monies from the Golden Gate Bridge should be employed to increase mass transit use in that travel corridor, either over the Bridge itself, on the water, or through an underwater tube.

PLAN 1 - DESCRIPTION

VEHICULAR SYSTEM

Intercity Roads

No proposed vehicular facility is added to the existing Intercity Road system in Plan 1.

Arterials

Three major improvements to the City's Arterial network are shown on the Plan 1 map. Two Arterials in northern San Mateo County are also suggested, with the purpose of completing the Brisbane vehicular network along the Bayshore Freeway.

Route	Direction to Downtown	Type of Improvement
San Francisco		
1. Army-Sanchez-Clipper, from James Lick Freeway to Portola Boulevard	Circumferential	Widen Roadway
2. Carroll, from Hunters Point Freeway to Bayshore Highway	Radial; local connector to intercity routes	Extend arterial northwest from Mendell to Phelps; ramp to Freeway
3. Evans, Hunters Point Boulevard to Lockwood Street	Radial	Extension SE, under Hunters Point Freeway to Naval Reservation
San Mateo County		
1. Guadalupe Expressway	Circumferential	Extension east to Bayshore Freeway
2. Geneva Avenue	Circumferential	Extension, east to Bayshore Freeway (at Hunters Point Freeway interchange)

Parking

Three existing parking areas that primarily serve local or short term auto traffic are shown on Plan 1: (1) the major garages in the CBD, (2) the University of California Medical Center garage at Parnassus Avenue, and (3) the large parking area at Candlestick Park. A commuter parking location at the Daly City BARTD stop is also shown as "existing".

No new major structures are proposed for local or short term parking. One proposed commuter parking area is indicated on the map at the Balboa Park BARTD stop.

MASS TRANSIT SYSTEM

Intercity

Three intercity rapid transit rail lines, plus intercity ferry and aircraft, are proposed in this plan to complement the BARTD system approved in 1962. The new rail system would reflect, in essence, a six-county rapid transit plan. The three new rail facilities can be termed (1) the Daly City extension, (2) the Geary-Airport line, and (3) the Twin Peaks-Marin County line.

Daly City Extension:

The BARTD Market-Mission rapid transit line, shown as an "existing" line from the East Bay tube to Daly City on all three plans, is extended in Plan 1 from Daly City south, parallel to Junipero Serra Freeway to San Bruno and continued along the present Southern Pacific right-of-way to Menlo Park. If Santa Clara County joins the WBRTA district, the rail line could continue to San Jose and beyond.

A spur track south of the San Bruno station would provide a rail stop for San Francisco International Airport.

Geary-Airport Rapid Transit:

A new rapid transit line crossing the existing BARTD line under Market Street would serve the Richmond, Western Addition, CBD, South of Market, and the South Bayshore districts of San Francisco; and would provide passenger interchange at the Montgomery Street Station.

The last stop would be at Geary and 33rd Avenue; shifting north to Post Street near Presidio Avenue and crossing Market at Post, the line would continue southeast under Second Street to China Basin and under Third Street to the Southern Pacific right-of-way at Bayshore Freeway.

The common mezzanine at the Montgomery Street station would allow a transfer line from Geary and 33rd Avenue to East Bay destinations as well. Thus, a convenient route from East Bay points would be possible west to Geary stations and south by way of Daly City to San Mateo County stations, including the Airport.

Twin Peaks-Marin County Rapid Transit:

The final link in the rapid transit system would employ high-speed trains in the upper level of the Market Street tunnel and in a tunnel under Twin Peaks. The tunnel is noted as "existing" to St. Francis Circle and "proposed" to San Francisco State College on Plan 1.

Plan 1 proposes that the Twin Peaks line become the San Francisco segment of a San Francisco-Marin County intercity rapid transit line, in a subaqueous tube from Aquatic Park to Sausalito, and then north to Novato and Santa Rosa. In San Francisco, the subway would turn off Market Street along Drumm under the Embarcadero Center to Washington Street and under Columbus Avenue to Aquatic Park.

Persons traveling on the Twin Peaks-Marin County line could transfer to the Market-Mission line at four stations along Market Street. They could also transfer to the Geary-Peninsula line at the Montgomery Street station.

Express Bus

The present Transit Terminal at First and Mission Streets with added freeway ramps would be used for intercity bus trips originating from or departing to points outside the San Francisco Metropolitan Area. The existing intercity vehicular network can be used for trips crossing the Bay or headed south along the Peninsula.

Ferry

Two ferry terminals are proposed in Plan 1 - one at the Market Street Ferry Building and one at Aquatic Park. Terminals located near three Marin County cities are suggested: Sausalito, Tiburon and San Rafael.

Local Transit *

Rail Facilities:

Rapid transit proposals in Plan 1 have been chosen in terms of a metropolitan system, and thus rapid transit terminal points within the City would serve rail lines that extend beyond the City limits. Three of these local terminal points are shown on the map of Plan 1.

The San Francisco State College station at Nineteenth and Holloway, and the Judah and Nineteenth stop -- the terminus of the Judah-Haight branch line -- are two San Francisco terminal stops for the proposed Twin Peaks-Marin County trunk line. A North Beach-Marina branch line has been suggested in other reports and, though not shown on Plan 1, could be included as part of the total Twin Peaks-Marin County line. A third San Francisco terminal stop shown on Plan 1 is the 33rd Avenue station on the proposed Geary-Airport line.

Bus Facilities:

The proposal to build the San Francisco side of the Twin Peaks-Marin County line to rapid transit specifications would transform the present Market Street streetcar system. All five routes would have feeder buses to complete the line where the subway terminates, and these bus routes are noted on Plan 1.

* For further details see Section IX, Addendum, "Plan 6 - Subway Under Market", which is similar in some respects to Proposed Policy Plan 1.

PLAN 1 - PROBLEMS AND OPPORTUNITIES

Implementation of this plan poses serious questions in regard to costs. Completion of the rail rapid transit network shown would be beyond the foreseeable financial resources of San Francisco under present law, undoubtedly requiring additional funds, from motor vehicle taxes and State and Federal monies.

For example, the rail rapid transit tube to Marin County, a transit facility of great potential value to San Francisco, would probably require a Marin rapid transit network. Such a network appears beyond the means of a county whose population is now around 200,000. To the south the two rapid transit lines (BARTD extension and Bayshore rapid) would require nearly a half billion dollars of financial commitment from San Mateo County with or without assistance from Santa Clara County. Within San Francisco itself, the Geary-Bayshore and Haight-Judah rapid lines would probably require the commitment of an additional half billion dollars for their construction.

Recognizing that these large sums of money may represent actual bargains in terms of the costs of alternative vehicular systems and parking facilities in the core of the City, it is still necessary to attach to this plan the contingency of massive federal assistance to transit comparable to the previous interstate highway program which paid 90 percent of the cost approved routes. Whether or not such legislation will occur is clearly beyond the scope of this paper.

The opportunities in this plan lie in the City's readiness to implement extensive new rapid transit facilities if financing becomes available. Under these terms of reference Plan 1 could be seen as a contingency plan; it indicates how extensive new rapid transit networks could be built and provide the greatest benefit to San Francisco.

PROPOSED POLICY PLAN 2

A MAJOR RELIANCE ON MASS TRANSIT IN THE CENTRAL BUSINESS DISTRICT AND ON THE AUTO ELSEWHERE

PLAN 2

Assuming that employment density is increasing and will continue to increase in the CBD, mass transit should play the major role in providing for work trips to that area. Only those CBD trips which cannot be provided for via mass transit would be planned for via vehicular facili-

PLAN 2

PLAN 2

Assuming that employment density is increasing and will continue to increase in the CBD, mass transit should play the major role in providing for work trips to that area. Only those CBD trips which cannot be provided for via mass transit would be planned for via vehicular facilities and then primarily by means of increasing the capacity of the existing vehicular system. Such improvements would consist of widening Arterials and creating new pairs of one-way streets, and would not necessarily include construction of new Intercity Roads to serve the CBD.

Non-CBD transportation needs, including travel within the City and through the City, should be provided for via improved and new Intercity Roads and Arterials. Heavy through travel should be carried primarily on Intercity Roads.

PLAN 2 - SET OF POLICIES

1. The scale of commute rail travel should provide a system oriented to the CBD.

2. A regional rail terminal in the heart of the CBD should be built to serve local rail travel to the airport, intercity rail travel within a 500-mile radius, and any cross country rail travel.

3. Auto restriction policies, such as road capacity limitations and limited parking, should be implemented in the CBD.

4. Major new rapid transit lines and terminals serving the CBD should be given top priority for City funds.

5. The scale of intercity highway travel through the City should provide for a high-capacity limited-access route that bypasses the CBD.

6. New vehicular facilities should not be directed to the CBD except for new or improved one-way pairs adding capacity to Marin-CBD travel.

7. Vehicular facilities of an Arterial nature bypassing the CBD should be constructed when necessary according to their priority as part of the total system.

8. A short takeoff and landing aircraft facility should be considered adjacent to the CBD.

9. An additional level should be added to the Golden Gate Bridge for transit use with the type of transit vehicle to be determined by structural studies of the Bridge.

PLAN 2 - DESCRIPTION

VEHICULAR SYSTEM

Intercity Roads

One Intercity Road is suggested in Plan 2 to add to the existing system. When completed, this road could provide for vehicular movement from northern counties via the Golden Gate Bridge and through San Francisco to the Junipero Serra Freeway and southern counties. Besides providing through trips, the proposed road would also serve major district-to-district trips within the western section of the City and intercity travel leaving from or arriving at City locations.

The proposed road would be designed as: (1) depressed roadway on Park-Presidio and part of Golden Gate Park; (2) tunnel under part of the Park, and Lincoln Way from 21st Avenue to Sunset Boulevard; (3) depressed on Sunset to Ocean Avenue; (4) tunnel from Ocean Avenue to Lake Merced Boulevard; and (5) along Lake Merced Boulevard and Brotherhood way to the Junipero Serra Freeway. As proposed, this road would not require major acquisition of private property. It should also be noted that the depressed areas of this roadway would not be substantially different from those presently existing.

The southern section of the Hunters Point Freeway is shown as an "existing" Intercity Road on Plan 2, with a proposal that the road be terminated about one mile south of the City's limits at the Guadalupe Expressway-James Lick Freeway interchange.

Arterials

Nineteen proposed improvements to the City's existing Arterial network are shown on Plan 2.

Six of the improved Arterials would add capacity to the existing Northern Waterfront-Marina street network, which would continue to provide Marin-San Francisco trips as well as intracity travel. Four proposals are located in the South Bayshore district, where a neighborhood plan is presently in progress. The remaining improvements would add to the existing system at various locations within the City, often to provide approaches to the intercity vehicular system.

One of the nineteen proposed improvements is located in San Mateo County but, as part of the City's system, is shown on Plan 2 as a proposed Arterial.

	Route	Direction to Downtown	Type of Improvement
	San Francisco		
	Northern Waterfront-Marina		
1.	Battery & Sansome, from Broadway to Embarcadero	Radial	Extend existing one-way pair
2.	North Point & Bay, from Embarcadero to Bay/Van Ness	Radial	Redesign for one-way pair
3.	Embarcadero, from Broadway to North Point	Radial	Design new roadway for Battery-North Point & Bay-Sansome one-way connection
4.	Bay, from Van Ness to Fillmore	Radial	Widen roadway to capacity of Bay-North Point pair
5.	Lombard-Richardson, from Van Ness to Doyle Drive	Radial	Design reversible lane for increased peak hour capacity
6.	Gough, from Sacramento to Bay	Radial & Circumferential	Extend existing one-way (in pair with Franklin); widen to four lanes throughout
	South Bayshore		
7.	Evans, Naval Reservation to Army	Radial & Circumferential	Redesign for four-lane divided highway, interchange with Hunters Point Freeway
8.	Carroll, Hunters Point Freeway to Bayshore Boulevard	Radial	Extend road from Third Street to Bayshore; redesign for four-lane divided highway
9.	Candlestick Park-South Bayshore road, from Naval Reservation to James Lick Freeway at Geneva extension	Circumferential	New four-lane divided highway; frontage road for Hunters Point Freeway to Candlestick Park

Route		Direction to Downtown	Type of Improvement
	South Bayshore (continued)		
10.	Third Street, Bayshore to Fourth Street/China Basin area	Radial	Widen and channelize roadway throughout South Bayshore-Central Basin districts
	Western Addition		
11.	Golden Gate & Turk, from Masonic to Market	Radial	Redesign for one-way pair
12.	Webster-Guerrero, from Turk to Army	Circumferential	Extend Webster to meet Guerrero at Market, widen roadway
	Mission, Diamond Heights		
13.	Army-Clipper, from James Lick Freeway to Portola	Circumferential	Connect Army to Clipper at Church-Sanchez with six-lane divided highway throughout
14.	O'Shaughnessy, from Woodside-Portola to Southern Freeway	Circumferential	Design four-lane divided scenic roadway
	Sunset, Sunset Heights		
15.	Lincoln Way, from 21st Avenue to Kezar Drive	Radial	Widen roadway
16.	Sixth & Seventh Avenues from Lincoln Way-Lawton to Woodside	Circumferential	Redesign for one-way pair merging into widened Seventh Avenue south to Lawton
	South of Market		
17.	Third & Fourth Streets from Third Street (near China Basin) to Market	Radial	Redesign for one-way pair with overpass at Townsend. Adoption of this proposal to be contingent upon construction of a high-level viaduct to carry traffic over the navigation channel.

Route		Direction to Downtown	Type of Improvement
	Outer Mission-Visitacion Valley		
18.	Sunnydale-Persia, Bayshore Boulevard to Mission-Ocean	Circumferential	Connect Sunnydale to Persia at McLaren Park and extend east to Bayshore Boulevard
	San Mateo County		
19.	Geneva extension, from Bayshore Boulevard to James-Lick Freeway	Circumferential	New six-lane divided highway, interchange at James-Lick Freeway

Parking

Three existing parking areas that primarily serve local auto traffic are shown on Plan 2: (1) the major garages in the CBD, (2) the University of California Medical Center garage at Parnassus Avenue, and (3) the large parking area at Candlestick Park.

Additional local parking in the CBD, and the Northern Waterfront district, is proposed in Plan 2 to supplement the existing supply. The fare structure of garages in both of these districts should be designed to serve short term parking while discouraging commuter parking. Additional parking at the present Third and Townsend rail yards is also proposed to serve the air terminal.

In addition to the Daly City BART station parking areas shown as "existing", two new commuter parking areas are proposed, the Army Street and Candlestick Park stations of the Bayshore-Airport rail line.

MASS TRANSIT SYSTEM

Intercity

Improvements to the existing mass transit system proposed in Plan 2 include new rail, bus, and ferry facilities, most of which would bring persons to transit terminals in the CBD.

The BARTD System, presently in construction stage, is shown as "existing" from the Bay tube to Daly City on Plan 2.

Another intercity rail proposal deals with the concept of a new eastern-corridor line. As shown on Plan 2, the Southern Pacific line would be: (1) upgraded, following its present right-of-way in San Francisco and San Mateo Counties; (2) extended in tunnel from Third and Townsend Streets to a new terminal at Second and Market Streets; and (3) extended into and underneath the passenger terminal at San Francisco International Airport. *

The Market Street Terminal has special significance in this plan. Designed to encourage public transit from the airport to the CBD, the Terminal building could house the special equipment used in controling flight reservations presently kept at the airport; reservations, ticketing, and check-in of passengers and luggage could be accomplished at the Market Street Terminal, to allow a direct connection to and from flights. The Terminal would have passenger access from the Montgomery Street station of BARTD and Muni.

A rapid transit route from the San Francisco CBD to suburban communities in Marin County is proposed in Plan 2, using a transit deck on the Golden Gate Bridge. This proposal includes: (1) the construction of a second deck on the Golden Gate Bridge for transit use, with this right-of-way to be continued in Marin County; (2) transit right-of-way through the Presidio; (3) a subway generally under Chestnut Street and Columbus Avenue; and (4) a continuous connection with the subway-surface lines at the Davis-Drumm station. The subway surface cars used would be the vehicles for a joint North Beach-Marina-Marin County extension of Muni rail service.

* An alternative for part of this route would be the extension of the Southern Pacific tracks at Seventh Street to a location at Mission or immediately south of Mission and thence under or paralleling Mission to the main terminal at Second and Market. This line could then be expanded at a later date to the East Bay.

Ferry

Commuter ferries are proposed in Plan 2, which would leave from the Ferry Building and Aquatic Park for Marinship and Tiburon destinations.

Local Transit *

The upper deck of the downtown BARTD tunnel and the continuation under Twin Peaks to St. Francis Circle is shown as "existing" in all three plans. In Plan 2, the tunnel would be used for a high platform rail line from Davis Street to San Francisco State College. The extension from St. Francis Circle to the terminal at the college is shown as "proposed".

The upper deck of the downtown tunnel would also be used by subway-surface cars, using the tunnel west to Duboce, and on the street following the Judah "N" line. The remaining streetcar routes that branch off from Market Street at present would be replaced by express buses that transfer to the Market Street subway. The Church "J" express bus would continue along Market Street to the Ferry Building.

A proposed Geary subway is shown on Plan 2, from 33rd Avenue and Geary Boulevard to Market and Post Streets. Passenger access could be provided through the Montgomery Street station mezzanine to BARTD and Muni trains, as well as to the San Mateo and Airport lines. The transit tunnel serving Marin County would be connected directly to the Muni subway line.

* For further details see Section IX., Addendum, "Plan 5 - Subway, N under Market".

PLAN 2 - PROBLEMS AND OPPORTUNITIES

There are three major problem areas concerning Plan 2: (1) the construction of a transit deck on the Golden Gate Bridge to connect to Muni; (2) use of the Southern Pacific right-of-way and track to provide passenger service to the Bayshore and on south to the airport; and (3) financing for a Geary rapid transit line within San Francisco.

Since these are all primarily transit questions, the same reservations in regard to new sources of financing would apply here are applicable to Plan 1, but to a lesser degree because of the lower expenditures involved. Since even a source for necessary financing of the BARTD system is currently in question, clear answers regarding the availability of new transit monies must await legislative action from the State and Federal Governments.

Regarding the use of the Golden Gate Bridge for transit, if structural questions can be solved by using lighter equipment, a transit deck would be less costly than the one formerly proposed for autos only. Also, with Marin County now studying the use of a bus which could run on rail or road, there is still a possibility that a transit deck could be built later when a successfully functioning bus mass transit system required it. A new look at how to build a lower deck for transit use is needed.

Difficulties in expanded joint use of Southern Pacific rails for passengers and freight appear formidable but not insurmountable. A rail extension from the present Southern Pacific depot to Market Street together with service to San Francisco International Airport would have great potential advantages for the movement of air freight (a new air freight center is included in the recently approved Airport Bond Issue) as well as air passengers and airport employees. Hopefully, such advantages will not go unnoticed by Southern Pacific management which currently opposes increased headway on the basis of more difficulties in meeting its freight commitments.

A recent City study on the modernization of the Muni system placed the Geary rapid transit line second in priority to improved transit service to the Bayshore-Hunters Point District and the Airport. As previously contemplated in the unsuccessful Muni Bond Issue the Geary line would cost more than $200 million dollars, with initial service to Masonic requiring about half that amount. Construction on this line would await railroad upgrading and/or new construction needed to serve areas between the CBD and the Airport.

The opportunities of Plan 2 are its potentials for extensive rapid transit service to the Peninsula and to Marin County at reasonable cost and without a sacrifice in new road construction not oriented to the CBD. The concept of a major new transit terminal adjoining the Muni-BARTD station at Montgomery and Market Streets opens exciting possibilities for greater development at this location, as well as complete service to the City and all of the surrounding suburban areas via rapid transit. Under these terms Plan 2 can be seen as the plan of priority for immediate further study; it poses policy questions which need resolution before more detailed study is done on the more expensive and potentially disruptive proposals of Plans 1 and 3.

PROPOSED POLICY PLAN 3

A MAJOR RELIANCE ON THE AUTO THROUGHOUT THE CITY

PLAN 3

Plan 3 is oriented much more to vehicular travel than either Plan 1 or Plan 2. The guiding principle is that a transportation system composed of roads (together with existing or committed transit facilities) can best serve the travel needs of our many dispersed activities

PLAN 3

PLAN 3

Plan 3 is oriented much more to vehicular travel than either Plan 1 or Plan 2. The guiding principle is that a transportation system composed of roads (together with existing or committed transit facilities) can best serve the travel needs of our very diverse population, and that this system will allow maximum choice and flexibility in the movement of people and goods. It further notes that such a system can be the basis of a comprehensible and desirable physical framework for the City, and one which can be compatible with San Francisco's existing urban structure and topography.

Plan 3 uses the principle of new Intercity Roads to and through the City as the best and necessary means of accommodating intercity travel coming from increased regional population and increased auto ownership.

PLAN 3 - SET OF POLICIES

1. The scale of improvement to the San Francisco Intercity Road network should be such as to allow intercity trips to use the most direct route in the region.

2. Major investments in rapid transit should be limited to accommodating increased commuter loads from other counties and high priority needs within the City.

3. Intercity rail travel should be accomplished by a transfer to the BARTD system.

4. There should be minimum limitations on all day parking in the CBD so long as the proposed vehicular system provides for the majority of the trips.

5. Two or more intercity helicopter or short takeoff aircraft facilities should be located within the City.

6. An additional level should be added to the Golden Gate Bridge with four lanes for automobiles and buses.

PLAN 3 - DESCRIPTION

VEHICULAR SYSTEM

Intercity Roads

Four Intercity Roads are described here: the Embarcadero-Presidio connection, the Presidio-Junipero Serra connection, the O'Shaughnessy connector (all three noted as "proposed" on Plan 3), and the Bay Front Freeway in San Francisco continuing through San Mateo County (noted as "existing" on Plan 3, as one alternative for continuing the adopted Hunters Point Freeway).

These four added to the City's existing Intercity Roads would provide a network of:

(a) three north-south routes, one north to the Golden Gate Bridge and two north to the Bay Bridge;

(b) two east-west routes, one from the Golden Gate to Bay Bridge and one from Daly City to the India Basin Bridge; and

(c) two diagonal routes crossing the City.

Embarcadero-Presidio Connection:

A Golden Gate Bridge-Bay Bridge connection would allow free vehicular movement from Marin County to the East Bay, to the CBD eastern periphery, and beyond the CBD to the India Basin Bridge.

The bridge-to-bridge connection would be designed for three lanes each way, two lanes for auto and one reserved for buses. The routes would be in tunnel or tube except when elevated to meet its connection points at the Embarcadero, and in the Presidio near the Golden Gate Bridge.

The route would start at the elevated Embarcadero Freeway, descend to grade level near Union Street, continue northwest as a tunnel under the Embarcadero to a point between Powell and Mason, continue west in a tunnel north of Fisherman's Wharf and the Aquatic Park commercial/recreational core to the Marina at Baker Street and in tunnel until it rises to meet the Presidio Bridge approach at Doyle Drive.

Presidio-Junipero Serra Freeway Connection:

A connection from the Golden Gate Bridge to the Junipero Serra Freeway in San Mateo County would allow free vehicular movement through the City; from western districts of the City to destinations in Marin and more northerly counties or San Mateo County and more southerly counties; and district-to-district trips within the western section of the City.

This route, from the Presidio highway south, would be designed as: (1) depressed freeway along Park-Presidio Boulevard (2) tunnel under Golden Gate Park and Seventh Avenue to Lawton Street (3) surface freeway to Noriega Street and Laguna Honda Boulevard (4) tunnel to Junipero Serra Boulevard and south of Ocean Avenue, and (5) depressed freeway along Junipero Serra Boulevard to the Junipero Serra Freeway. This connection would relieve traffic congestion on Nineteenth Avenue.

O'Shaughnessy Connector:

A redesign of the O'Shaughnessy route to meet limited access, high-capacity standards, in conjunction with the use of a section of the proposed Presidio-Junipero Serra connection and the existing Southern Freeway, would allow free vehicular movement for intercity trips from Marin County to the East Bay via the proposed Hunters Point Freeway and India Basin Bridge, and to northeast San Mateo County via the existing Bayshore Freeway. Persons starting from points along the O'Shaughnessy connector could leave the City by the Golden Gate Bridge or India Basin Bridge, or could drive to City destinations.

Bay Front Freeway:

The Hunters Point Freeway, including the north and south approaches to the India Basin Bridge, has been funded by the State and is shown as an "existing" Intercity Road on all three plans with the same alignment in San Francisco. However, the alignment south of the City is subject to planning decisions by San Mateo County and San Francisco, and is shown differently on each plan.

Plan 3 proposes an off-shore, over-the-water freeway along the San Mateo County Bay Front south to San Jose, following present California State Highway proposals. It is shown on Plan 3 as far south as the San Francisco International Airport. This continuation, termed the Bay Front Freeway, would parallel the existing Bayshore Freeway.

The design of the Bay Front Freeway should allow free water access and no additional Bay fill, with standards acceptable to the California Bay Conservation and Development Commission.

Arterials

Twelve improvements to the City's Arterial network are shown on Plan 3. Seven of the improved routes are radial to the CBD while five are located to circumvent it. All twelve facilities provide access to Intercity Roads, and strengthen internal travel within the City. Three of the routes (Lombard-Richardson, Bay, and Gough) are likely to serve Marin County travel as well as internal trips.

Route		Direction to Downtown	Type of Improvement
1.	Richardson-Lombard from Van Ness to Doyle Drive	Radial	Remove center island, design reversible lane for increased peak-hour capacity
2.	Bay, from Cervantes to Embarcadero	Radial	Widen roadway
3.	Golden Gate and Turk, from Masonic to Market	Radial	Redesign for one-way pair
4.	Third Street, Bayshore Boulevard to Market	Radial	Widen roadway; one-way pair with Fourth Street. Adoption of this proposal to be contingent upon the construction of a high level viaduct to carry traffic over the navigation channel.
5.	Fourth Street, Third Street, to Market	Radial	Redesign for one-way pair; overcross Townsend
6.	Evans, Naval Reservation to Army	Radial (S.E. of Embarcadero Ext.)	Redesign for four-lane divided highway
7.	Carroll, Hunters Point Freeway to Bayshore Boulevard	Radial	Extend road from Third to Bayshore; redesign for four-lane divided highway
8.	Gough, Sacramento to Bay	Circumferential and Radial	Change to one-way (in pair with Franklin), widen to four lanes throughout

Route	Direction to Downtown	Type of Improvement
9. Webster-Guerrero, from Lombard to Army	Circumferential	Extend Webster to meet Guerrero at Market, widen roadway
10. Army-Clipper, from James-Lick Freeway to Portola	Circumferential	Connect Army to Clipper at Church-Noe with six-lane divided highway throughout
11. Sunnydale-Persia, Bayshore Boulevard, to Mission-Ocean	Circumferential	Connect Sunnydale to Persia at McLaren Park and extend east to Bayshore Boulevard
12. Geneva, Bayshore Boulevard, to James-Lick-Geneva interchange to Bay Front Freeway	Circumferential	New four-lane divided highway; interchange at James-Lick Freeway

Parking

Three existing parking areas that primarily serve local auto traffic are shown on Plan 3: (1) the major garages in the CBD, (2) the University of California Medical Center garage at Parnassus Avenue, and (3) the large parking area at Candlestick Park.

Additional local parking in the CBD, the Northern Waterfront district, and at the present Third and Townsend rail yards is proposed in Plan 3 to supplement the existing supply. The proposed CBD parking covers a larger area in this plan than in Plan 2.

Commuter parking planned for the BART Daly City terminal is shown on Plan 3 as "existing". New commuter parking areas are shown at stations along the BART extension.

9.	[illegible]	[illegible]	[illegible]
10.	[illegible]	[illegible]	[illegible]
11.	[illegible]	[illegible]	[illegible]
12.	[illegible]	[illegible]	[illegible]

MASS TRANSIT SYSTEM

Intercity

The Market-Mission rapid transit rail line of the BARTD regional system is assumed to be the only intercity line needed in Plan 3. Noted as "existing" south to Daly City, an extension of the rail line is proposed past Daly City to serve suburban communities in San Mateo County. This route would generally follow the Southern Pacific right-of-way south of San Bruno.

Two intercity bus systems are proposed in Plan 3. Assuming the termination of the present Southern Pacific commute service to San Francisco, one route would begin at the San Bruno station of the extended BARTD line and continue north through the Bayshore corridor of the City, using Bayshore Freeway and the Southern Extension of the Embarcadero Freeway. This route would terminate at the Transbay Terminal replacing the service of Southern Pacific which now ends at Third and Townsend Streets. A second intercity route, serving Marin and Sonoma Counties would also use the Transbay facility. This second route would travel north by means of a reserved lane on the Embarcadero-Presidio vehicular intercity connection. The buses would then continue on a reserved lane through the Bridge approaches, across the Golden Gate Bridge, and over Waldo grade.

An alternate plan would extend BARTD only to the San Francisco International Airport Terminal and keep Southern Pacific in service for most Peninsula commuters.

Local Transit *

Mass transit proposals in Plan 3 have been chosen in terms of providing necessary local service at minimum cost. These terms of reference assume that significant gains in transit patronage will not occur.

Modernization of Muni Streetcar System:

Subway-surface cars, would run through the upper level of the Market Street subway, continuing along the existing tracks of the J, K, L, M, and N lines. With the exception of the new tunnel right-of-way under Market Street, system operation would continue in much the same manner as at present.

* For further details see Section IX., Addendum, "Plan 1 - All Lines Under Market".

Geary Express Bus Service:

New equipment and improved signalization would be employed to further improve existing service.

Bus Facilities:

Retention of the Muni streetcar system would mean that new bus feeder routes would not be needed to replace streetcar lines. In the Bayview-Hunters Point area express buses could be routed along the Southern Extension of the Embarcadero Freeway into the Transbay Terminal and across Market Street to the financial district via the Clay-Washington Freeway ramps.

PLAN 3 - PROBLEMS AND OPPORTUNITIES

Two major questions are posed regarding the implementation of Plan 3: (1) can the three major new Intercity Roads proposed (Presidio-Junipero Serra, O'Shaughnessy, and Embarcadero-Presidio) be built without serious damage to the portions of the City through which they pass, and (2) will resulting increases in parking and road facilities in the CBD do damage to its compact and concentrated nature?

With current City policy opposing construction of a second deck on the Golden Gate Bridge and an Embarcadero-Presidio Freeway (Golden Gate Freeway), further studies leading to construction of such an Intercity Road appear unlikely in the near future. The Presidio-Junipero Serra and O'Shaughnessy routes are affected by the same City policy in that their construction pre-supposes traffic increases greater than the present capacity of the Golden Gate Bridge. A basic assumption of Plan 3 is that increased traffic pressure from the soon to be completed Junipero Freeway, the new India Basin Bridge, and a double-decked Golden Gate Bridge would require construction of new limited access, high capacity roads. Preliminary studies of these routes indicate that extensive tunneling would be necessary and that design speed would be lower and number of lanes would be less than proposed by previous freeway studies of these routes.

The effect of massive increases in downtown parking lots on the compactness of the financial, governmental and shopping areas has yet to be assessed. It seems likely, however, that new parking garages in the core area will be expensive and will require some governmental subsidy in order to be built. As an example, the recently proposed Pine-Bush garage would cost more than $10,000 per stall and would entail City subsidy for an initial period of years.

The opportunities in this plan lie in the City's ability to build new Intercity Roads with minimum disruption should they prove necessary. In these terms Plan 3 can be seen as a road contingency plan; it shows how intercity connections could be built and provide the greatest benefit to San Francisco.

V

COMPARISON OF PLAN POLICIES

INTRODUCTION

The three policy plans have shown graphically how each set of transportation proposals would be added to the existing transportation system. This section aims to highlight differences and similarities in the three policy plans by extracting the essential chosen policies in words and comparing them.

V COMPARISON OF THREE PROPOSED POLICY PLANS

POLICY MATTER	PLAN 1 A Major Reliance on Mass Transit Throughout the City	PLAN 2 A Major Reliance on Mass Transit in the CBD and on the Auto Elsewhere	PLAN 3 A Major Reliance on the Auto Throughout the City
1. Priority as to type of Transportation Facility	First priority to be given to development and completion of citywide network of rapid transit lines. Significant expansion of vehicular system to await completion of rapid transit plan.	Preference to be given to development of mass transit, but vehicular projects to be undertaken concurrently: Mass transit to be given preference on projects leading to CBD; Vehicular circulation to be given priority in outer lower density areas.	Preference to be given to development of heavy volume vehicular routes.
2. Expanded-Region Travel			
Road	City to be bypassed by new and additional intercity traffic.	Intercity Roads to be circumferential only, and not to pass through the CBD.	Intercity Roads in peripheral locations, but including routes to the CBD.
Rail	Rail service to points beyond Bay Area, to be achieved by service utilizing commuter railroad and suburban rapid transit lines.	Downtown terminal to combine commuter rail, rapid transit and airline services.	Park and ride stations to be located at transfer points in suburbs along rapid transit lines.
Air Helicopter and Short Take-Off and Landing Planes (STOL)	Service to airports and STOL-Ports to be primarily by rapid transit	Heliports and STOL ports to be located in downtown areas.	Heliports, STOL-Ports in downtown, and airports distributed throughout region.

V COMPARISON OF THREE PROPOSED POLICY PLANS --Continued

POLICY MATTER	PLAN 1 A Major Reliance on Mass Transit Throughout the City	PLAN 2 A Major Reliance on Mass Transit in the CBD and on the Auto Elsewhere	PLAN 3 A Major Reliance on the Auto Throughout
3. Bay Area Travel			
Road	Full bypass system to carry traffic around high density urban areas.	Suburban north-south travel (but not to CBD) to be facilitated by one peripheral Intercity Road.	Suburban travel between counties and to CBD to be facilitated by two freeways and one express parkway.
Mass Transit	Suburban travel to be primarily by rapid transit.	Suburban travel to be by highway, commuter railroad, rapid transit, and express bus.	Suburban travel to be by highway, rapid transit, and express bus.
Golden Gate Bridge	No Second Deck, development of rapid transit line with bridge toll funds, using transit tube under Bay.	Development of Second Deck for subway-surface cars or rail buses, with bridge toll funds.	Second Deck for buses and autos, including reserved lane for buses.
4. City-Wide Travel			
Road	City-Wide vehicular circulation on basically the existing system with some improvements. No substantial increases in vehicular capacity.	Improvements to Arterials. One new Intercity Road, peripheral north-south route. Increases in vehicular capacity in some instances.	Extensive Improvements to Arterials and three new Intercity Roads. Overall increases in capacity of vehicular system.
Mass Transit	Most inter-district travel to be accommodated on city-wide rapid transit system with bus feeders.	Inter-district travel to be accommodated on rapid transit and subway surface-car lines.	Inter-district travel to be on rapid transit lines, subway surface-car lines, and express buses.

V COMPARISON OF THREE PROPOSED POLICY PLANS -- Concluded

POLICY MATTER	PLAN 1 A Major Reliance on Mass Transit Throughout the City	PLAN 2 A Major Reliance on Mass Transit in the CBD and on the Auto Elsewhere	PLAN 3 A Major Reliance on the Throughout the City.
5. Downtown Circulation			
Road	No substantial additions to capacity of radial routes to CBD.	Improvement to Arterials leading to CBD involving some increases in capacity, but no new Intercity Roads.	One new Intercity Road leading to downtown from Golden Gate Bridge, plus improvments to Arterials leading to CBD.
Rapid Transit	Most trips to CBD to be accommodated by city-wide rapid transit network.	Majority of trips to CBD accommodated by rapid transit commuter railroad, and subway-surface-cars.	Majority of peak-hour trips to CBD to be accommodated by rapid transit subway-surface-car lines and increases in auto travel to CBD.
Parking	No substantial increase in off-street parking to be added. Supply of privately financed off-street parking to be restricted in inner areas of CBD and limited to parking for customers, business visitors, and persons needing cars in business or to provide services.	No increase in parking in inner area of CBD, but some increases in parking zone surrounding it, primarily for customers, business visitors and persons using cars in business or to provide services.	Increases in parking zone surrounding CBD's inner area.

VI

EXPECTED DEVELOPMENTS

AND

ISSUES

INTRODUCTION

To this point the focus of the paper has been on choosing alternatives for long-range transportation plans. All three policy plans propose new transit or automobile systems which may take from five to 10 years or more to move from conception to execution. What is to be done to deal with transportation problems which are with us now while we wait for our long-range plans to materialize?

Some impending transportation changes assume major importance to San Francisco and offer opportunities which should not be allowed to slip away. Among physical developments are Market Street, the new Muni, and the impending India Basin Bridge. Among current major issues are mass transit to the Peninsula and the Airport, completion of BARTD and improved mass transit to Marin and Sonoma Counties. This section aims to provide guidance by clarification and suggested programs for the above developments and issues.

EXPECTED DEVELOPMENT NO. 1	The reconstruction of Market Street.
OPPORTUNITY	Much of Market Street must be torn up in the process of the construction of BARTD; how does San Francisco want it put back? The City has a "once in a lifetime" opportunity, that of coordinating its plans for the beautification of Market Street with the BARTD schedule, so as to take maximum advantage of the work already contracted for. Another opportunity exists in the possibility of construction of a regional Davis-Drumm station.
FACTORS	Funding for Market Street would come from Gas Tax, the United States Department of Housing and Urban Development, the Bay Area Rapid Transit District, and a City bond issue. However, the City's contribution is requisite to receipt of funds from other sources. Private citizens have already contributed funds sufficient to design a regional Davis-Drumm station. The importance of this station is seen in that it is merited by existing population density, and will be adjacent to the huge new complex named Embarcadero Center, construction of which will begin soon. Estimates indicate that this station would be the 4th busiest in the entire BARTD network (after Montgomery, Civic Center, and Powell, per BARTD figures).
POSSIBLE PROGRAM	1) Highest priority to achieving a successful bond issue for the development of Market Street; if the bond does not pass as soon as possible, which will be in June of 1968, the City will not be able to coordinate with BARTD work, and great waste and duplication will result. 2) Highest priority to raising funds for the construction of a regional Davis-Drumm station.

EXPECTED DEVELOPMENT NO. 2	Implementation of new Muni system.
OPPORTUNITY	The citizens and officials of the City of San Francisco have recognized the need for improving transit facilities both within the City and to suburban communities. They have emphasized that Muni vehicles must have separate rights-of-way off City streets as far as is financially feasible, and that the use of transit should be encouraged. This attitude, coupled with the construction of BARTD, offers an unprecedented opportunity to modernize and coordinate the Muni system.
FACTORS	A joint study by the staffs of the Department of City Planning, the Public Utilities Commission, and the Department of Public Works was completed in October, 1967. The major alternatives for modernization of the Municipal Railway System were clarified, studied, and a recommended system was shown. * A statement was prepared of transit engineering studies that would be necessary for a bond issue. The Public Utilities Commission is studying types of rail and bus equipment for the new Muni underground system; the choice of equipment will affect the design of the subway stations to be built by BARTD. The Public Utilities Commission has asked for changes in BARTD's plans to include an underground Muni terminal at Davis-Drumm, whether or not a regional station will be constructed there. BARTD financing is necessary to build the underground Muni line as originally planned from Van Ness Avenue to Twin Peaks tunnel, and from Twin Peaks tunnel to St. Francis Circle. Transit in the Geary corridor needs to be improved. Rapid transit in construction or anticipated, creates new possibilities for Muni on the Peninsula and to Marin.
POSSIBLE PROGRAM	1) Retention by Public Utilities Commission of transit engineering consultants to complete the work necessary for a November bond issue.

* See Addendum: "Progress Report on Local Transit".

2) Selection of subway-surface and rapid transit equipment.

3) Construction of high platform stations for Muni at Davis-Drumm, Montgomery, Powell, Civic Center, and Van Ness Avenue stations.

4) Work toward adequate financing so BARTD can meet its 1962 commitments to build the Muni subway to St. Francis Circle.

5) Coordination of the new Muni system with the new rapid transit lines.

6) Implementation of a surface express bus line in the Geary corridor, and studies for a future Geary-Post rapid transit rail line in subway.

7) Extension of Muni service into San Mateo County along the Junipero Serra and Edgemar Freeways to provide service for the ridgeline and coastside residential development, both direct to the City and to rapid transit stations for transfer. Thus, complementary bus and rail service to San Francisco, the Peninsula, and the Airport would be provided, and this network would form the southern section of the regional system.

8) Consideration of extending the Muni subway-surface line from the Davis-Drumm station across the Golden Gate Bridge to link with the Northwestern Pacific tracks to Santa Rosa, the logical future terminal of a Marin commuter railroad. San Francisco State College would be the Muni terminal of the line, and thus a rail line would become part of the northern section of the regional system.

EXPECTED DEVELOPMENT NO. 3	Construction of the India Basin Bridge.
OPPORTUNITY	Greatly improved access to Hunters Point can mean industrial and residential growth in an area of the City now stigmatized as a ghetto.
FACTORS	Bridge construction can occur when authorized by the State Legislature and would require approximately six years for completion. Design plans are now being undertaken jointly by the Division of Bay Toll Crossings and the Division of Highways. Hunters Point Freeway, necessary to connect with the new bridge, is not part of the interstate system and therefore not eligible for federal financing which would re - quire its completion by 1972. Preliminary Plans for two redevelopment projects, Butchertown (industrial), and Hunters Point (residential), have been approved by the Planning Commission and could reach the stage of execution at the same time as the bridge. The Hunters Point Freeway Agreement with the State, already signed by the City, fixes location of the route around the perimeter of the Hunters Point area. Key questions in regard to recreational use of land near the freeway and access to open water remain unanswered until detailed design plans are shown to the City.
POSSIBLE PROGRAM	1) Continued liaison between the City and the State to carry out the City's objectives in regard to design excellence for the bridge and freeway, as well as maximum retention of usable water recreation areas. 2) Coordination of redevelopment plans, with bridge and freeway construction for minimum inconvenience to residents and businesses in the area.

3) Integration of bridge and freeway into the City transportation network including consideration of the mass transit needs of residents, employees and persons using Candlestick Park.

4) Development of maximum recreational potential of the new shoreline created by the freeway and adjacent filling for industrial development.

ISSUE NO. 1

Improved transit along the San Francisco Peninsula.

OPPORTUNITY

The West Bay Rapid Transit Authority must approve a rapid transit system by June 30, 1968, to be placed before the voters of San Mateo County in the Spring of 1969. The three major alternatives under consideration are:

1) Upgrading of the Southern Pacific system in San Francisco, San Mateo County, and possibly Santa Clara County, with an extension underground in San Francisco to a new Second and Market Streets terminal, and an extension from the Southern Pacific line to the San Francisco International Airport passenger terminal.

2) Extending BARTD from Daly City to the San Francisco International Airport passenger terminal, with an airline service center at the BARTD Powell Street station at Fifth Street in San Francisco.

3) Extending BARTD from Daly City south in San Mateo County, with a connecting service to San Francisco International Airport.

FACTORS

Upgrading of the Southern Pacific would be the least expensive of the alternatives. The existing Southern Pacific system goes through a large, increasingly important area of the City, more than five miles long and one to four miles wide. This area needs to be served by improved rail transit, but no plans exist. San Francisco needs a rapid rail line to its Airport and almost half of the proposed line would be in San Francisco. The downtown terminal would serve as a vital element of the rapid transit station complex at the Market-Montgomery-Geary-Second Streets City-and-regional interchange; there would be three (possibly four) rapid rail lines sharing a common mezzanine level, making complete, all-points service conveniently available. The new downtown terminal would permit release by Southern Pacific of the existing Third and Townsend Streets terminal.

From Daly City, the nearest point of major passenger destination for a BARTD extension is the Airport. Completion of this extention would enable BARTD to serve both airports, SFIA directly, and Oakland International Airport to the point of transfer. Airport passengers could use any of the BARTD stations, and the airline service center in Powell Plaza could provide ticketing for either airport, luggage and hotel service, etc. Southern Pacific would still be the only rail line south of the SFIA and north along the Bay shore.

A BARTD extension from Daly City to a point farther south than SFIA appears to exceed financial abilities.

POSSIBLE PROGRAM

1) The upgrading of the Southern Pacific, to serve the City and to serve the City's Airport. This would include use of the existing Southern Pacific terminal and four station-stops at approximately one-mile intervals (i.e., improvements to the three existing plus one new) to serve the districts which make up this large southeastern section of the City. Upgrading would include improved rail schedules, coordinated feeder service, park-and-ride arrangements, and Airport feeder service from the Southern Pacific San Bruno station. Coordination must take place with the Southern Pacific and with WBRTA in time to meet the time limitations to which they are subject.

2) Construction by the City of an extension underground from the existing Southern Pacific terminal to a new downtown terminal near Second and Market Streets, sale or lease of air rights, construction of a new station-stop between Fifth and Sixth Streets to replace the existing terminal, and possible construction Stolport over the site of the existing Southern Pacific terminal.

3) Construction of an extension from the Southern Pacific line to the SFIA passenger terminal, modification of the Airport to accommodate direct rapid rail service, and coordinated passenger and air-freight rail service to San Francisco.

4) Extension of Muni service into San Mateo County along the Junipero Serra and Edgemar Freeways to provide service for the ridgeline and coastside residential developments, both direct to the City and to rapid transit stations for transfer. Thus, complementary bus and rail service to San Francisco, the Peninsula, and the Airport would be provided.

5) As an alternative (if Southern Pacific were not upgraded), extending BARTD from Daly City to the San Francisco International Airport passenger terminal, with an airline service center at the BARTD Powell Street station at Fifth Street in San Francisco.

ISSUE NO. 2	Heavily increasing need for mass transit to and from San Francisco International Airport.
OPPORTUNITY	Because of this anticipated demand, and in conjunction with the new network of rapid transit lines under construction or planned in the Bay Area, a rapid rail line to San Francisco International Airport is now vitally needed and economically feasible.
FACTORS	A recent report done for the City estimated that if ground transportation can be adequately expanded, air passenger growth at the Airport will go from 12 million in 1967, to 18 million in 1971, and to 24 million in 1975. Experience in other cities indicates that whereas fixed rail lines serving only airports are uneconomic, fixed rail lines which enlarge their system to include airport service more than meet additional costs. The internal circulation system at the Airport works quite ineffectively during the peak hours now; anticipated aircraft will carry five times as many passengers as are carried today, reducing air travel fares and stimulating demand for mass transportation service from the Airport to the City. The press of people in automobiles converging upon the Terminal has continued to heighten the disparity between airport-to-airport jetliner travel speeds, and bumper-to-bumper auto traffic slowness to and from the Airport. Whereas passage of an Airport bond issue makes monies available for more aircraft facilities, present Airport plans do not include rapid transit. In the near future BARTD and the new Muni system will be completed, and Marin and San Mateo Counties have established Transit Authorities to plan rapid transit systems. The Southern Pacific system now operates from Santa Clara County, through San Mateo County, to near-downtown San Francisco....by-passing the fourth busiest airport in the world enroute. San Francisco International Airport now surpasses the passenger volume of London's Heathrow Airport; Chicago's O'Hare is still the world's busiest, John F. Kennedy in New York second; and Los Angeles International third. Southern Pacific now carries 12,000 commuters daily; Southern Pacific management

recently reported that they could accommodate more than a 50% increase in present commuter volumes without difficulty. Twenty percent of all present Airport passengers go to the San Francisco central business district, and ninety percent of all present Airport passengers come from counties served by BARTD and Southern Pacific

A downtown terminal at Second and Market Streets would share a common mezzanine level with the Montgomery Street BARTD-Muni station;; it would serve as a vital element of a rapid transit City-and-regional interchange. It would be located in the CBD of San Francisco, the center of an important and expanding region, which would be consistent with the trend of increasing density of employment in the CBD and increased business and tourist flights. Hotel, entertainment, restaurant, and convention facilities would be at hand.

The Airline Terminal Building could be designed to provide for the many services presently needed or anticipated. It could house the special equipment, now located at the Airport, used in controling reservations. Reservations, ticketing, and check-in of passengers and luggage could be completed at the downtown terminal, with direct connection to and from flights. Modern rapid trains would incorporate new methods of handling the checked-in luggage, and provide racks for hand luggage and parcels.

The downtown terminal would also provide ticketing service for Peninsula commuters and to more distant points. Improved service would generate short-haul intercity trips to cities such as Santa Cruz, Monterey, and Salinas, as well as encourage improved service to Los Angeles as urban areas served by the route grow in population.

POSSIBLE PROGRAM

1) Immediate inclusion of preparation for fixed rail rapid transit in designs now being done for San Francisco International Airport.

2) As in the preceding section on improved mass transit along the San Francisco Peninsula, we recommend upgrading of the Southern Pacific system, an underground extension in San Francisco to a new Second and Market Streets terminal, and an extension from the Southern Pacific line to the SFIA passenger terminal, in that order of priority. Upgrading should include use of modern trains and equipment, and direct connections to flights, including pre-ticketing and check-through of luggage.

3) Construction, when appropriate, of a modern Airline Terminal Building over the downtown rail terminal.

4) As an alternative (if Southern Pacific were not upgraded), extending BARTD from Daly City to the SFIA passenger terminal, with an airline service center at the BARTD Powell Street station at Fifth Street in San Francisco.

ISSUE NO. 3

Completion of the Bay Area Rapid Transit District system.

OPPORTUNITY

The City should plan so as to derive the maximum benefit from the construction of the BARTD regional stations in San Francisco.

FACTORS

The four Market Street stations are discussed in the sections pertaining to the new Muni system, and to the development of Market Street; four other BARTD stations will be constructed in the City.

A "Mission District Urban Design Study" was prepared for the City Planning Commission in the context of several planning and renewal programs conducted in the City. A specific purpose of the study was to determine and recommend necessary actions in the immediate vicinity of Bay Area Rapid Transit District stations at 16th and 24th Streets which would help to assure maximum public and private benefit from station construction. The two station areas are seen as centers, as opposed to the present strip development.

The Glen Park BARTD station will be only eight minutes from Montgomery Street. The Balboa Park station is only two minutes farther. These two stations will each produce more daily home-based trips than any other station in the BARTD system. *
Both stations offer opportunities for new commercial and residential development. The existing Muni rail and repair yard alongside the Balboa Park station provides valuable air rights for possible development.

Funds for improvements around these station areas are included in the June Market Street Bond Issue.

POSSIBLE PROGRAM

1) Concentrated administrative and residential development related directly to the Mission Street stations.

* Per Northern California Transit Demonstration Project. See supporting table on page No. 86.

2) Wider sidewalks for Mission Street at the station entrances, narrowing to create bays for parking along the service area of the street between the two stations. This would be similar to the design for Market Street, creating areas for amenities such as trees, benches and kiosks.

3) New commercial and residential development should be accommodated in the immediate vicinity of the Glen Park station entrance.

4) At Balboa Park Station:

   a. Use of air rights over the Muni yard;

   b. A City-built park and ride lot over the Southern Freeway adjacent to the station entrance; and

   c. Feeder bus service for nearby institutions, e.g., City College and Lick-Wilmerding High School, to gain maximum benefit from rapid transit.

ISSUE NO. 4	Improved San Francisco-Marin-Sonoma mass transit.
OPPORTUNITY	The Boards of Supervisors of San Francisco and Marin County, and the Marin Transit District, have voted against a second deck for autos on the Golden Gate Bridge, and the Bridge Directors have voted to give their support to the improvement of mass transit. Funds are available from the surplus of tolls on the bridge which could be applied to mass transit improvement of regional significance. The Marin Transit District has taxing powers which could be increased through a referendum.
FACTORS	The cost of constructing a subaqueous San Francisco-Marin tube appears to be greater than could be justified now, and for some time to come, by the population to be served. Buses are in service now and appear to be the most appropriate mass transit means for the immediate future. Studies are being made of a bus which can operate on road or rail. One ferry boat is in service now, and more may be tried. Strong popular support has developed in Marin and San Francisco for large ferry boats as a solution. State legislators have indicated interest in:

a. Expanding the jurisdiction of and local representation on the Board of Directors of the Golden Gate Bridge and Highway District; *

b. Turning responsibility for the Bridge over to the State Division of Bay Toll Crossings which operates the other San Francisco Bay Bridges;

c. New engineering studies to indicate what type of rail vehicles could be accommodated on a Bridge lower deck.

* The latest proposal would add one more San Francisco and two more Marin representatives and would broaden the mass transit powers of the Board.

POSSIBLE PROGRAM

1) Engineering feasibility studies of a transit deck on Golden Gate Bridge for rail subway-surface cars or buses.

2) Engineering feasibility studies of a transit tunnel or the use of existing rails in San Francisco.

3) Increased ferry service initiated on a trial basis.

4) Studies of the bridge toll plaza, approaches, reserved bus lanes, express bus lanes, integration of local and suburban transit routes, and modifications in the ferry service area.

5) Traffic engineering techniques applied immediately to speeding up Marin bus service in San Francisco.

VII

SUMMARY

The major intent of this paper has been to show how consistent City policies could be geared to overall transportation plans. Three such plans, each one selected because of overall adherence to a particular set of guiding principles, have been used. The three sets of policies which accompany the physical plans may be summarized as follows:

1. We must expand our present mass transit system using every means at our disposal including restriction on the use of private automobiles throughout the City.

2. We must expand mass transit to and from the central business district using every means at our disposal including restrictions on the use of private automobiles while at the same time allowing for relatively unrestricted use of private automobiles everywhere except within the central business district.

3. We must expand our present automobile transportation system using every means at our disposal; we must expand our mass transit system only when necessary in order to accommodate decisions by agencies outside of the City.

These three courses of action have been presented within the framework of enhancing San Francisco's central role in the Bay Area region. Major regional goals of strengthening transit systems to counties north and south of San Francisco, and to San Francisco International Airport, have been stated.

Goals, Principles and Standards in terms of which all transportation plans must be measured have been included. Throughout this section of the working paper the interrelated nature of mass transit and vehicular facilities has been stressed.

In order to include a focus on what can be done now and in the immediate future the section titled "Expected Developments and Issues" has been included. The need for the City to move quickly in order to capture fully the opportunities at hand in such important areas as Market Street and the Airport has been brought out.

In choosing the combinations of mass transit and vehicular proposals used in each of the three policy plans, the intent has been not only to consider each transportation corridor individually but also to relate one to another. Thus, in Plan 2, similar transit equipment would serve the Twin Peaks corridor, Marina corridor, and Marin and Sonoma Counties, to give one example. No limitation on new proposals or different combinations of corridor solutions is implied. The need for attention to a smoothly functionizing overall citywide transportation system is stressed.

Full comparisons of the three overall transportation policy plans in this paper must await further study and the availability of more complete regional data from the Bay Area Transportation Study. It can be stated at this time, however, that continuing emphasis on both modes of transportation in San Francisco will be necessary. This observation points strongly towards ruling out any transportation plan which fails to take adequate account of the regional needs of both mass transit and the private automobile. It has been stated earlier in the paper that Plan 2 offers alternatives which merit careful consideration now, especially before consideration of more expensive and potentially disruptive alternatives. Staff thinking currently favors Plan 2 as a point of departure for the next major step in San Francisco transportation planning, preparation of one overall policy plan.

VIII

TENTATIVE PROJECT SCHEDULE

A. Phase 1 - Review of Policy Alternatives

1. Develop objectives, base maps and background data	Presented October 20, 1966
2. Publish Working Paper No. 1 "Background, Scope and Objectives of a Revised Transportation Plan"	Presented & Distributed February 16, 1967
3. Publish Working Paper No. 2 "Three Alternative Proposed Policy Plans"	Present & Distribute March 14, 1968

B. Phase 2 - 1975 Policy Plan Preparation

1. Receive and analyze data — March-July 1968

   a. Bay Area Transportation Study Commission (Regional Traffic Information)

   b. Traffic Analysis Phase - Downtown Parking and Traffic Study (Local Traffic Data, Department of Public Works)

   c. West Bay Rapid Transit Authority (Peninsula Mass Transit Patronage Data)

   d. Northern California Transit Demonstration Project (Muni Patronage Data)

   e. Planning Commission response

   f. Responses of other City Departments

   g. Responses of citizens and groups

2. Policy Development — March-July 1968

   With emphasis upon medium range (1975) needs, develop a series of policies dealing with overall transportation in the City including the priorities to be given to various kinds of facilities to meet established goals, principles and standards

3. Plan Presentation - 1975 Policy Plan — July 1968

A. [illegible]

1. [illegible]

2. [illegible]

3. [illegible]

B. [illegible]

1. [illegible]

a. [illegible]

b. [illegible]

c. [illegible]

d. [illegible]

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IX

ADDENDUM:

PROGRESS REPORT

ON

LOCAL TRANSIT

For over a year the Transportation staff of the San Francisco Department of City Planning has been at work on a Transportation Plan Revision Project; Working Paper No. 1 was presented to the City Planning Commission in February 1967, and Working Paper No. 2 is now complete.

In July 1967, it was announced that Mr. Allan B. Jacobs, Director of City Planning, and Mr. James K. Carr, Manager of the Public Utilities Commission, had advised Mayor Shelley that they had agreed to pool the resources of their staffs to develop plans for a Muni Bond Issue and long range rapid transit plans. At the first meeting it was agreed that weekly meetings should be held and that Mr. S. Myron Tatarian, Director of the Department of Public Works, or his representative, should be invited to participate in all meetings.

As a consequence of the above work, the Director of City Planning was requested by the Mayor (September 5, 1967) to do additional work which would involve clarification of major alternatives for modernization of the Municipal Railway System and preparation of a statement of transit engineering and planning studies that would have to be undertaken to permit selection of one plan.

With the full cooperation of Public Utilities Commission and Department of Public Works staff members, the work was expedited and presentations made to the Capital Improvement Advisory Committee, the Mayor, and to a joint session of the City Planning Commission and Public Utilities Commission (October 24, 1967).

The following material resulted from all of the above activities. As part of the above process, the staffs of the San Francisco Departments have had meetings with staff members of other agencies and organizations also involved in Bay Area Transportation, including those in San Mateo and Marin Counties, and at the regional and state level. Information and viewpoints contained in studies and reports by these groups have been of great value.

I SAN FRANCISCO MUNI MODERNIZATION PLAN ALTERNATIVES

This exhibit consists of six diagrams depicting alternative Muni Plans.

A. Selection of Basic System

Two different operating positions regarding the best future Muni system are represented by (1) the "composite report" accompanying the successful 1962 BARTD Bond Issue, and (2) the recently unsuccessful Proposition "B". In the first instance, an entirely subway-surface system was proposed with five lines running on the same routes as today and coming together in a new subway tunnel under Market Street to be built by BARTD. In the second instance, an entirely rapid transit system was proposed with one trunk line, new underground stations, and feeder bus lines replacing the existing streetcars. The primary role of the City staff and transit specialists has been to evaluate these two concepts and possible combinations of the two.

For this purpose, six systems ranging from all subway-surface to all rapid transit and including combinations thereof have been selected and evaluated by a team of staff members from the Public Utilities Commission and City Planning Department.

B. The Six Alternative Muni Plans

Plan 1 - Five subway-surface car lines, "J", "K", "L", "M", and "N", with all lines coming together and operating in the subway tunnel under Market street;

Plan 2 - Four subway-surface car lines, "J", "L", "M", and "N", with a feeder bus replacing the end of the "K" streetcar line from the St. Francis Circle station;

Plan 3 - Three subway-surface car lines, "L", "M", and "N", with a bus replacing the end of the "K" line as above, and a feeder bus replacing the entire "J" line on Church, continuing downtown as an express bus on the surface of Market Street;

Plan 4 - Two subway-surface car lines, "L" and "N", and one subway trunk line to Holloway Avenue, with bus feeders operating as above, and with a feeder bus replacing the end of the "M" line from the Holloway station;

Plan 5 - One subway-surface car line, "N" and a subway trunk line and feeder buses as above, with a bus replacing the end of the "L" line from the West Portal Station;

Plan 6 - As proposed in Proposition "B", one subway trunk line fed by buses operating on portions of what are now streetcar lines (as above with a bus replacing the entire "N" line and continuing downtown on the surface of Market Street).

C. Basic Assumptions Used in Plans 1-6

1. System Operating in Addition to Muni:

We assumed that BARTD would be completed and in operation on the Mission-Daly City line with 90 second headways and running times as advertised in the BARTD literature.

2. BARTD Construction in Muni Lines:

We assumed that Muni would be provided with a completed subway running from a terminal at Davis and Market Street to St. Francis Circle including underground stops at Montgomery, Powell, Civic Center, Van Ness Avenue, Church, Castro, Forest Hills, and West Portal.

3. Running Times:

We used running times taken from BARTD's studies and from the Muni scheduling department. (Note: Allowances include slightly faster times where rapid transit is used as compared to subway-surface cars in tunnel, and substantially faster times where rapid transit service is used as compared to subway-surface cars on surface.)

4. Transfer Time:

We allow one half of the headway for waiting time where a transfer is required (i.e., if headway of train was four minutes we added two minutes to total trip time.)

5. Minimum Headway on One Track (Track Capacity):

We assumed a minimum headway of 90 seconds between units, whether the units be rapid transit or subway-surface.

6. Surface Delay:

The subway-surface lines were not assigned a penalty factor for surface delays which would not allow them to enter the tunnel at their scheduled time.

7. Passenger Capacity of Equipment:

We assumed a six car rapid transit train would carry a total of 600 passengers of whom 300 would be seated; a two car subway-surface unit would carry a total of 250 passengers of whom 110 would be seated. A bus would carry 75 passengers of whom 50 would be seated. *

8. Basis of Comparison for Figures:

All figures are compared with existing trip times, headways, and equipment capacity.

D. Criteria for System Selection

Transit specialists are to review these recommendations and prepare data on systems (3), (4), and (5), relative to one another and based on the following criteria:

1. Maximum speed from point of residence to place of destination for most people using the system;

2. Capacity adequate to provide for present patronage and with additional capacity available to allow for and encourage higher future patronage;

3. Maximum comfort and convenience, including consideration of seating for the maximum number of riders;

4. Minimum headway for an hour period at peak hours and at other times compared to today's system and anticipated growth;

5. Compatibility with the planned optimum long-range transportation system envisioned by the Public Utilities Commission and by the Department of City Planning to serve Marin, Peninsula, and East Bay commuters;

6. Compatibility with information gathered in the Northern California Transit Demonstration Project;

7. Maximum safety consistent with the above;

8. Cost of proposed system improvements; and

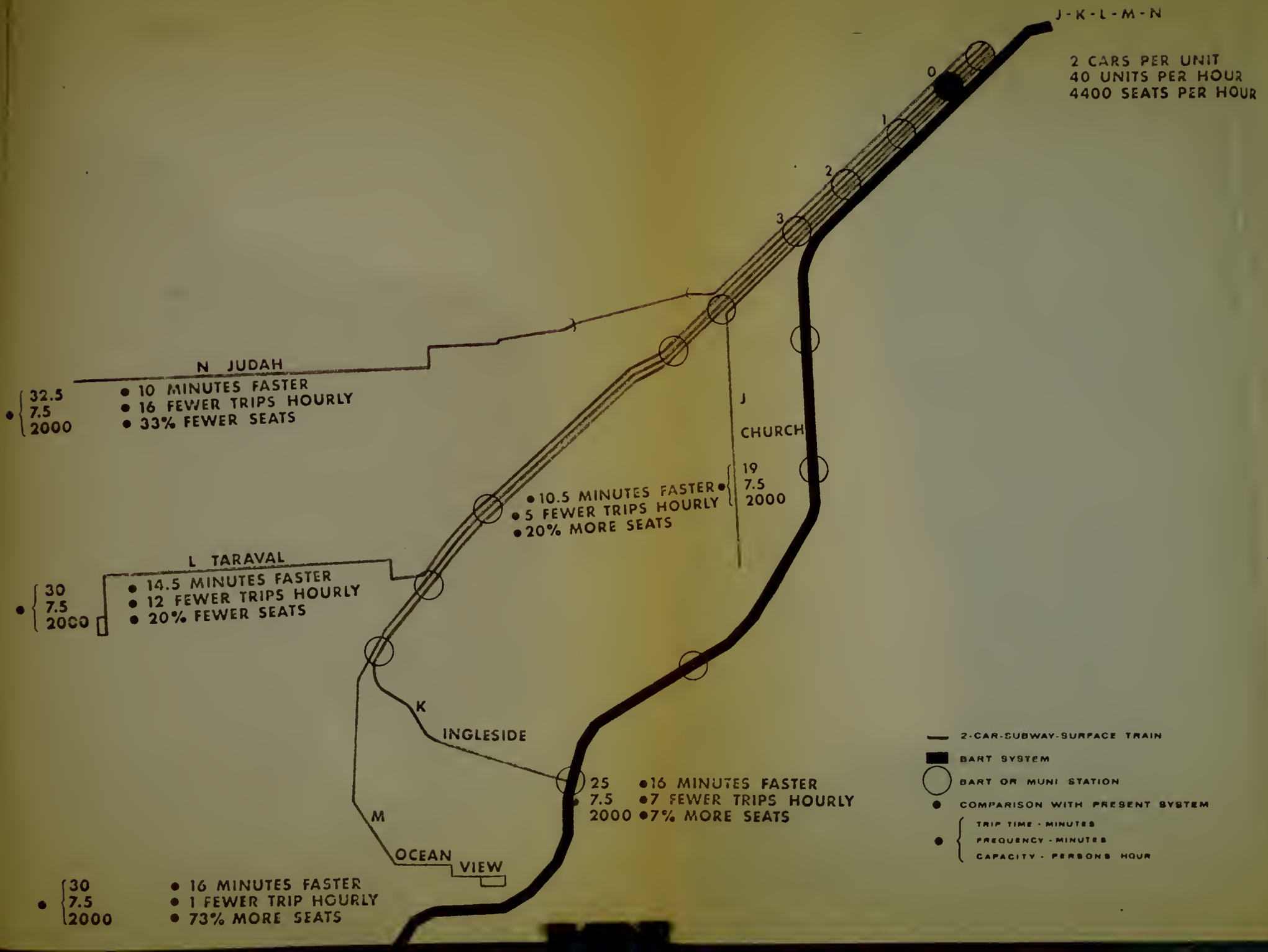
9. Additional criteria as necessary for preliminary design of the system.

* In the studies, capacities of all lines were based on the capacity of the larger transit vehicle, i.e., on a line with a six car rapid transit train connecting with feeder buses the total capacity of the six cars (660 passengers) was divided evenly among the areas served.

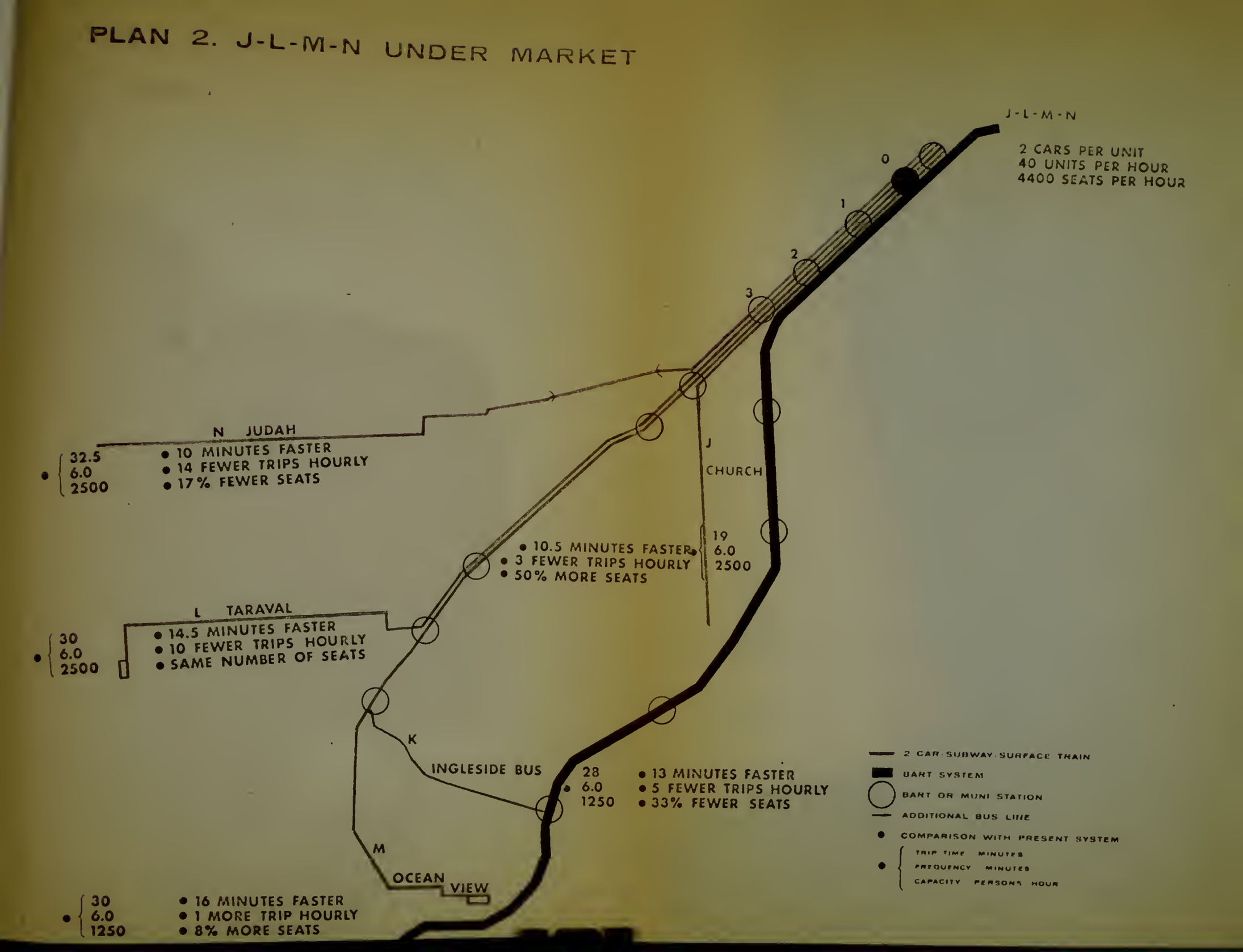
II CONCLUSIONS OF STUDY

Staff opinion favored Plan 5 which retains the Judah line as a subway-surface car and shares the upper level of the Market Street subway with a Holloway line which would function entirely as a rapid transit operation, employing six car trains if necessary during peak operations. Discussions with City officials lead to consideration of Plan 5 along with Plans 3 and 4 which retain the Taraval line as a subway-surface car operation. These plans differ in that Plan 4 has rapid transit to Holloway while Plan 3 retains the routing of the present "M" streetcar, converting it to a subway-surface car line. All parties agreed that the Judah line should be kept as a subway-surface car operation and that the Church line should be replaced by a bus. Anticipated competition of the BARTD 16th and 24th Streets subway stations with the present Church streetcar operation was a major consideration in arriving at this conclusion.

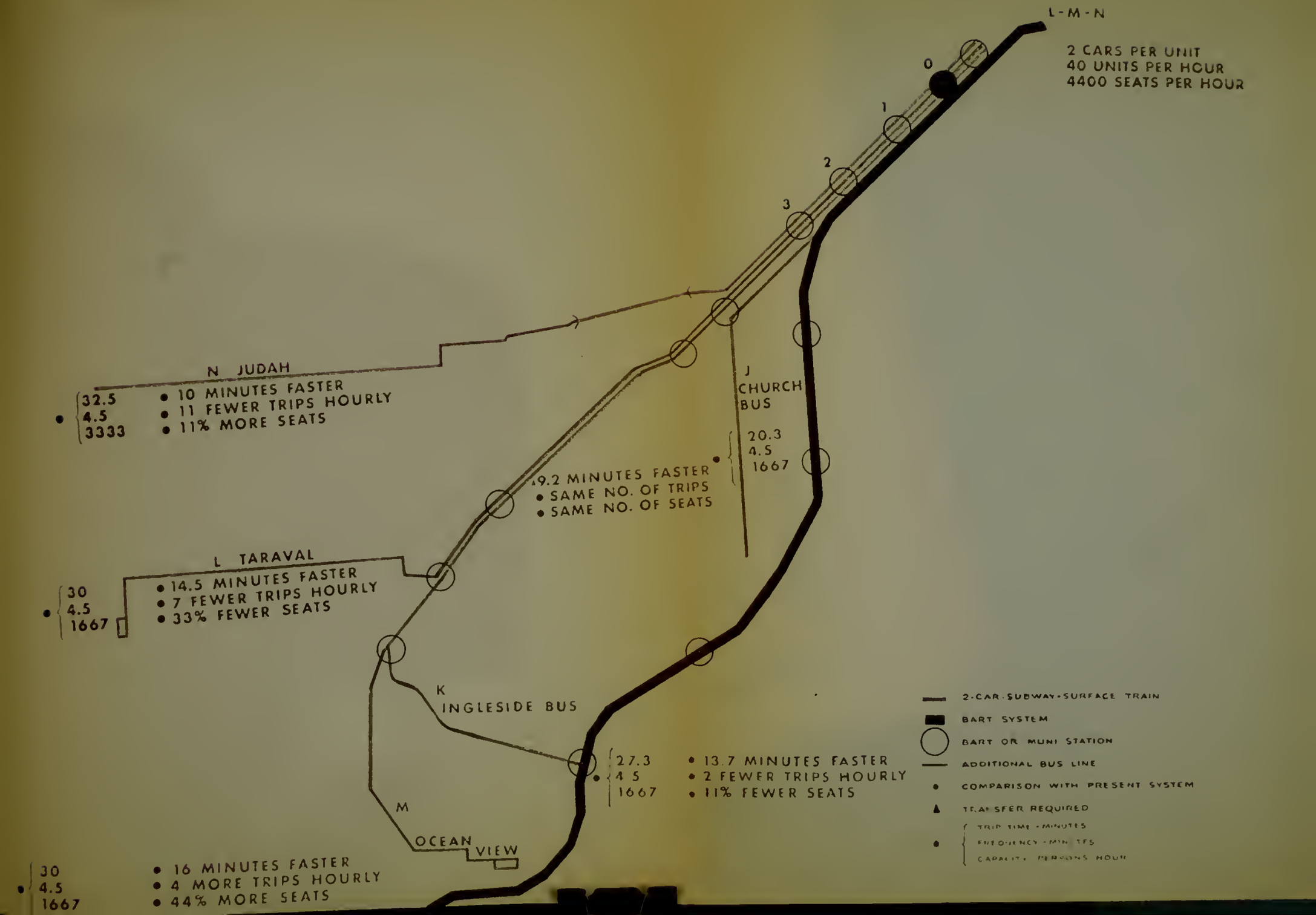
PLAN 1. ALL LINES UNDER MARKET



PLAN 2. J-L-M-N UNDER MARKET

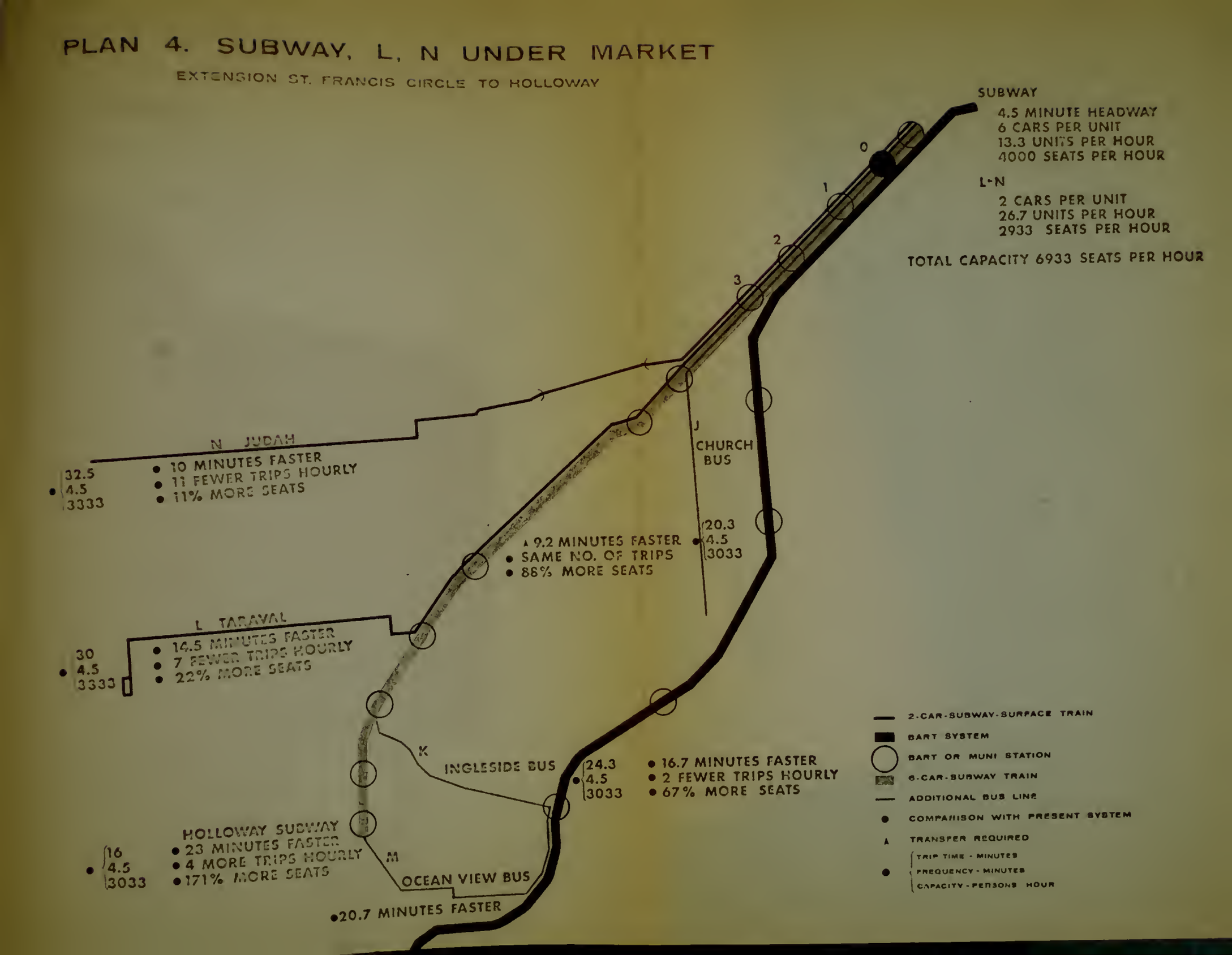


PLAN 3. L-M-N UNDER MARKET



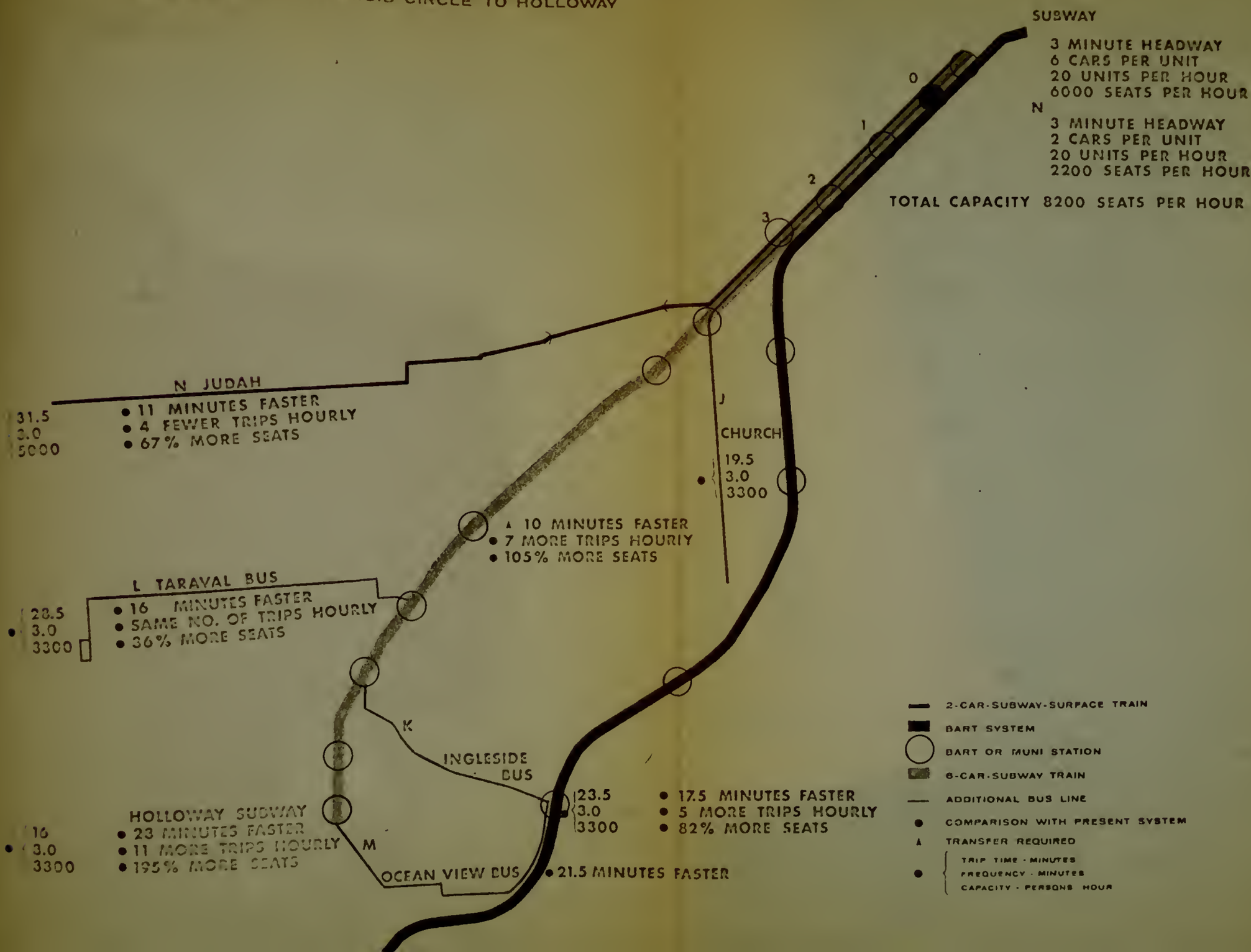
PLAN 4. SUBWAY, L, N UNDER MARKET

EXTENSION ST. FRANCIS CIRCLE TO HOLLOWAY



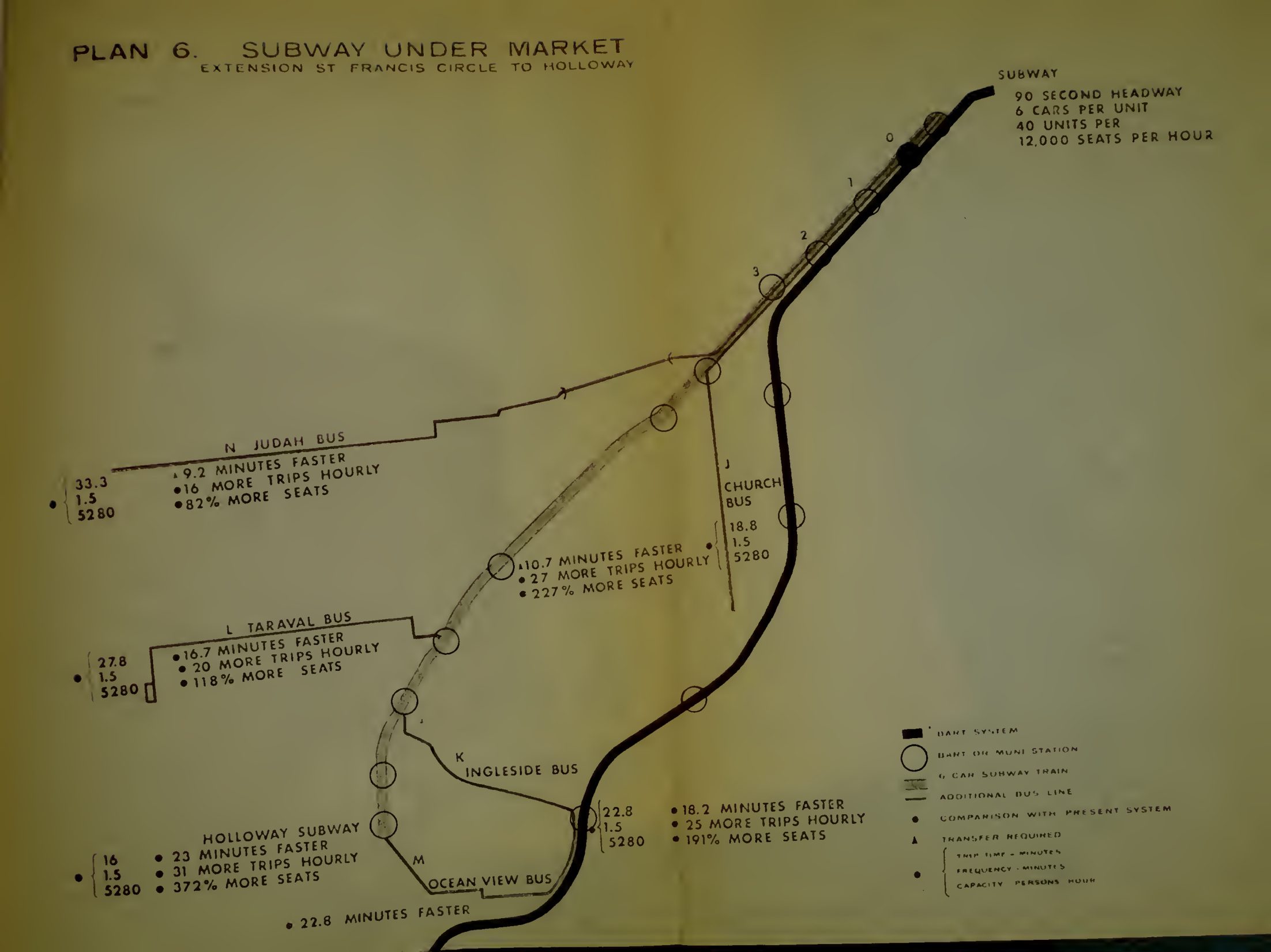
PLAN 5. SUBWAY, N UNDER MARKET

EXTENSION ST. FRANCIS CIRCLE TO HOLLOWAY



PLAN 6. SUBWAY UNDER MARKET

EXTENSION ST FRANCIS CIRCLE TO HOLLOWAY



PASSENGER VOLUME AT BARTD STATIONS IN 1975 *
(Adult Riders Prior to Adjustment for Fare Differentials)

Station	Total Boarding and Alighting: Productions (Home End)	Attractions (Non-home End)	Total	Percent Productions
Daly City	8,954	888	9,842	91.0%
Balboa Park	20,647	2,076	22,723	90.9
Glen Park	22,789	2,465	25,254	90.2
24th Street	19,306	6,891	26,197	73.7
16th Street	16,210	11,650	27,860	58.2
Civic Center	16,640	21,303	37,943	43.9
Powell Street	6,680	25,660	32,340	20.7
Montgomery Street	5,370	110,854	116,224	4.6
Subtotal-San Francisco Line	116,596	181,787	298,383	39.1
Oakland West	3,080	1,482	4,562	67.5
12th Street	7,235	11,323	18,558	39.0
19th Street	3,789	10,193	13,982	27.1
MacArthur	4,149	4,166	8,315	49.9
Subtotal-Oakland Stations	18,253	27,164	45,417	40.1
Ashby Place	4,677	1,255	5,932	78.8
Berkeley	8,436	6,791	15,227	55.4
North Berkeley	3,674	554	4,228	86.9
El Cerrito Plaza	3,870	355	4,225	91.6
El Cerrito del Norte	4,680	398	5,078	92.2
Richmond	2,967	669	3,636	81.6
Subtotal-Richmond Line	28,304	10,022	38,326	73.9
Rockridge	3,751	629	4,380	85.6
Orinda	1,245	141	1,386	89.8
Lafayette	1,711	72	1,783	96.0
Walnut Creek	3,116	202	3,318	93.9
Pleasant Hill	2,484	85	2,569	96.7
Concord	3,366	435	3,801	88.6
Subtotal-Concord Line	15,673	1,564	17,237	90.9
Lake Merritt	9,696	9,155	18,851	51.4
Fruitvale	20,199	3,602	23,801	84.9
Coliseum	7,440	902	8,342	89.2
San Leandro	7,679	2,646	10,325	74.4
Bay Fair	3,944	282	4,226	93.3
Hayward	6,007	2,261	8,268	72.7
South Hayward	2,125	302	2,427	87.6
Union City	2,612	809	3,421	76.4
Fremont	2,951	603	3,554	86.3
Subtotal-Fremont Line	62,653	20,562	83,215	75.3
TOTAL	241,289	241,289	482,578	50.0%

* "Coordinated Transit -- San Francisco Bay Area -- Now to 1975"
Final Report of Northern California Transit Demonstration Project
Prepared by Simpson and Curtin -- Transportation Engineers

p l a n n i n g c o m m i s s i o n . . .

william brinton	president
mrs. charles porter	vice president
mortimer fleishhacker jr.	
james kearney	
walter newman	
thomas mellon	
alternate: virgil elliot	
james carr	
alternate: walter wight	

s t a f f . . .

allan jacobs	director of planning
edward murphy	assistant director
lynn pio	administrative secretary

p r i n c i p a l s t a f f c o n t r i b u t o r s . . .

bruce woelfel william proctor robert frank robert levine
james jeffrey

g r a p h i c s . . .

frank hendricks jean cody eda kavin ruth van arsdel frances lawson